# The Alberta Journal of Educational Research

*Vol. II* *1956*

THE COMMITTEE ON EDUCATIONAL RESEARCH
*Faculty of Education*
*University of Alberta*

# *The Alberta Journal of Educational Research*

THE COMMITTEE ON EDUCATIONAL RESEARCH

*Faculty of Education*
*University of Alberta*

VOL. II, No. 1 MARCH, 1956

---

CONTENTS

PAGE

EDITORIAL ..... 5

The High School Program in Alberta during the Territorial Period 1889-1905 ..... 7
*B. E. Walker*

A Normative Survey of Reading Achievement of Alberta Children in Relation to Intelligence, Sex, Bilingualism, and Grade Placement ..... 18
*Wm. H. Coull*

A Critical Evaluation of the Detroit Beginning First Grade Intelligence Test ..... 30
*Frederick Powell*

A Survey of the Arithmetical Achievement of Grade Five Pupils in Alberta Schools ..... 41
*Ralph O. Pritchard*

Jacques Maritain: Man and Educator ..... 49
*Edward Blake Coll, C.S.B.*

Texts in Measurement and Evaluation ..... 57
*S. C. T. Clarke and G. M. Dunlop*

BOOK REVIEW ..... 60
*R. S. MacArthur*

# *Editorial*

## EDUCATIONAL RESEARCH—REVIEW AND FORECAST

G. M. DUNLOP

At the beginning of the second year of continuous publication of the *Alberta Journal of Educational Research* it is proper to devote the editorial page to a review of the progess of educational research in Alberta, and to a forecast of its future.

The completion of the first year of publication of the Journal is an achievement in itself. It is the culmination of years of effort by many people whose names should be firmly fixed in the record. In the earlier history of the movement credit must be given to Dr. W. H. Swift, Mr. Rudolf Hennig, Mrs. D. A. Hansen, Mr. Lars Olsen, Dean H. E. Smith, Sir Arthur Stonhouse, Mr. A. G. Andrews, Mr. Eric Ansley and Mr. A. B. Evenson—representing University, Department, trustees, teachers, and the Home and School associations. In the later period of organization special mention must be made of the contributions of Mr. C. H. Macleod, Q.C., Chairman of the Board of Governors; President Stewart, Dr. W. H. Swift, and Dean Herbert E. Smith for what, in retrospect, seems to have been wise and perceptive guidance of the young movement. Finally, recognition must be given to the work of Dr. Harold S. Baker, whose responsibilities as editor, during the first year of publication, have been extremely heavy, and to the many competent research workers whose achievements constitute the actual research program in Alberta.

We are happy about our first year of publication. During this period we have made many errors, but we have also made provision for their correction. We have changed the format and binding of the Journal. Increasingly we are directing our attention to large definitive studies, involving many research workers, and away from the smaller projects of a single candidate for a degree. We propose to publish a quarterly *Research Newsletter* in which will appear more informal research reports, coupled with the news and gossip of the world of educational research. We plan the publication of *Research Monographs,* perhaps one each year. Each will report on groups of related studies previously published in the Journal, in a unified and carefully organized volume which should become a library resource for future students of educational research in Canada.

We have made a good beginning, but just a beginning. We need more funds donated to Capital Account, to secure the research move-

ment against depression or war. We need more funds donated to Current Account for the expansion of the ongoing research program. To this end new submissions are being prepared for all boards of school trustees and teachers' locals in the province. We hope for larger contributions from the five sponsoring bodies. We plan on the encouragement of contributions from business and industry.

We also need wider assistance and cooperation of interested individuals throughout the province. Not only do we need aid in the organizing and conducting of research; we also need aid in financing research and in the editing of research publications. We feel confident that there are many educationalists who will see these activities as legitimate and stimulating avocations for members of our profession.

The future is at once a challenge and an opportunity. The organization of the research movement, the development of a functioning research program, and the completion of a year of continuous publication of the journal are no mean achievements. It is not to be forgotten that our research movement is unique in Canada. With increasing support will come the steady enrichment of the research program, the improvement of the Journal and the publication of the newsletters and monographs. These developments may well contribute to the stature of Alberta in Canadian education.

# THE HIGH SCHOOL PROGRAM IN ALBERTA DURING THE TERRITORIAL PERIOD, 1889-1905

B. E. WALKER
*Faculty of Education*
*University of Alberta*

To what extent is the present high school program in Alberta a legacy from the North-West Territories? A comparison of the curriculum in Alberta today with that in the Territories about sixty years ago should reveal what significant changes have taken place. In this historical survey an attempt is made to describe some of the major characteristics of the secondary school program used in the North-West Territories.

## A Prescribed Program of Studies

A notable feature of the development of the public school system of Ontario under the leadership of Egerton Ryerson was the organization of a strong central authority to prescribe curriculum for the whole province. The Ontario pattern of centralized control of curriculum was transplanted to the West and became firmly established in the North-West Territories.

The Legislative Assembly of the North-West Territories favored centralized control of the secondary school curriculum. When it provided in 1888 a special government grant of $350 per year for union high schools, the Assembly stipulated that the Territorial Board of Education should prescribe the program of studies. In 1892 the Assembly made the newly created Council of Public Instruction responsible for the preparation of a uniform curriculum for all school standards from one upwards, those above five being designated high school standards. In the same year there was added to the School Ordinance a section outlining a high school program as follows: ". . . the higher branches of a practical English and commercial education, the natural sciences, mathematics, and the Greek, Latin, French, and German languages."[1]

The first detailed program of studies for use in high schools in the North-West Territories was constructed by the Board of Education. In 1889 the Board of Education outlined a provisional program for the union high schools. In the following year the Board formally announced an extended and revised program.[2]

The high school program prescribed by the Board of Education contained a large number of academic subjects. For the school

[1]N.W.T., **Ordinances**: 1888, ch. 59; 1892, ch. 22.
[2]Board of Education, N.W.T., **Annual Reports**: 1888-89, p. 7; 1890-91, pp. 20, 131.

term ending June 30, 1891, each of the two high schools at Calgary offered the following subjects: reading, dictation, composition, writing, arithmetic, ethics, drill, grammar, geography, history, literature, bookkeeping, drawing, algebra, geometry, agriculture, physiology, hygiene, and Latin. The Calgary Separate High School offered, in addition, music, needlework, and French. The Calgary Public High School offered, in addition, botany and chemistry. Each high school teacher taught more than a score of subjects; each high school student pursued about a score of subjects.

The program prescribed by the Board of Education was noteworthy from the point of view of sectarian elements in the curriculum. Until 1892 the School Ordinances permitted a dual system of education. The Protestant section of the Board of Education announced the program for the Protestant schools, and the Roman Catholic section announced the program for the Roman Catholic schools. Judging from the programs offered in Calgary Protestant High School and Calgary Roman Catholic High School, there was almost complete agreement regarding the titles of courses considered suitable for the high school. There were, however, some basic differences in the content of certain subjects. The two Calgary high schools used different literary and historical materials as revealed in certain final examinations written by the candidates from the two schools. The two sections of the Board of Education cooperated each year to set one test paper in most of the high school subjects, but each section usually preferred to set its own paper in literature, reading, and history.

The change from the Board of Education to the Council of Public Instruction had significant consequences for the high school curriculum. The dual type of sectarian curriculum was replaced by a uniform, nonsectarian curriculum. After 1892 the program of studies prescribed by the central authorities contained no syllabus of religious instruction. Local authorities were permitted, if they so desired, to arrange for not more than a half hour of religious instruction at the end of the school day. In all the higher standards the authorized textbooks were the same for all tax-supported schools, care being taken to authorize only those texts written from a nonsectarian point of view. The external high school examinations were uniform for all candidates, regardless of religious denomination. The policy of prescribing a uniform, nonsectarian program of studies was continued when the Department of Education replaced the Council of Public Instruction in 1901.

In all the territorial high school programs there was adherence to the principle of centralized control of curriculum. Territorial

government agencies prescribed the program of studies to be used in all public secondary schools.

### A Program Shaped by Teacher Examinations

Teacher preparation was a dominant aim of the territorial high school program. The desire of the Board of Education to obtain a greater supply of trained elementary school teachers was reflected in certain features of the union high school program.

One striking feature was the close correspondence between the high school program and the program of academic subjects required for teachers' certificates. This correspondence is made clear in the following announcement: "The subjects of Standard V constitute the subjects of examination for the third class certificates, and those of Standard VI, except Latin and French, the subjects for the second class."[3] In equating the high school program with the academic requirements for teachers' certificates, the Board of Education set a far-reaching precedent for the future development of the high school curriculum in Alberta.

The inclusion of professional courses for teachers was another significant feature of the early high school curriculum. The School Ordinance passed by the North-West Assembly in 1888 provided that the Board of Education might authorize the establishment of a normal department in a union high school. In 1890 the Board arranged for the principal of Moosomin Union High School to offer, along with the regular academic program, a professional course consisting of a set of lectures on the science and art of teaching. Later, after receiving complaints that too much of the principal's time was being devoted to the professional training of teachers, the Board organized normal school courses conducted by school inspectors. Short normal sessions with low enrollments were conducted by school inspectors at Moosomin and Regina Union High Schools. In 1892 the Board offered to conduct normal sessions at the union high schools at Calgary, but no students accepted the invitation.[4] The attempt to organize normal school departments in union high schools was only partly successful in Assiniboia district and not at all successful in Alberta district.

The desire of the territorial school authorities to use the high schools to train elementary school teachers was also reflected in the close continuity between elementary and secondary school programs. For the most part the curriculum of the early high schools was a continuation and extension of the elementary school program. This was especially evident in the work in literature, composition,

---

[3] Ibid., 1889-90, p. 7.

[4] Council of Public Instruction, N.W.T., Report, 1896, p. 16.

grammar, spelling, reading, writing, history, geography, arithmetic, drawing, drill, and agriculture. Typical descriptions of courses in the official union high school programs were "the subject continued," "extension of the course," and "a review of English and Canadian history." Many of the texts used in the lower high school standards were the same as those used in the upper elementary school standards. The study of English was the main part of the program in both elementary and high school. The prominent place of English in the territorial high school curriculum reflected nineteenth century trends in United States and Canada in which English displaced Latin as the main secondary school subject. The organization of a high school program as a continuation of the vernacular elementary school program was an important step in the development of a free and universal system of public education with a single ladder from primary to secondary level.

The annual examinations of teachers' certificates administered by the state authorities had a dominant influence on the curriculum of the high schools in the North-West Territories. Beginning in 1886 the subjects of these examinations were similar to those of the elementary school program, the content being largely a review and extension of the work of the elementary school. A few professional courses were added: the science and art of teaching, physiology and hygiene, and school law. The examinations written in midsummer 1893 by the candidates for teachers' certificates were grouped as follows:

*Third Class*

Group 1 History, Geography
2 Literature, Composition, Grammar
3 Bookkeeping, Geometry, Algebra, Arithmetic
4 Science and Art of Teaching
5 Dictation, Writing, Reading
6 Drawing (optional), Agriculture (optional)

*First and Second Class*

Group 1 History, Geography
2 Literature, Composition, Grammar
3 Bookkeeping, Geometry, Algebra, Arithmetic
4 Science and Art of Teaching, School Law, Physiology and Hygiene
5 Dictation, Reading, Writing
6 Drawing (optional)
7 Agriculture (optional)[5]

Because there was such a strong pull to prepare the high school students for these examinations, the Council of Public Instruction found it expedient to allow the teachers' nonprofessional program to serve as the prescribed high school curriculum. There is ample evidence that the courses taught in the high school standards from 1893 until 1902 corresponded almost entirely with the academic

[5]N.W.T., Record Book, Nonprofessional Examinations, 1893-1902.

courses prescribed for the first, second, and third class teachers' certificates.[6]

### A Fixed Academic Program

The territorial high school program, prescribed by the central government authority and dominated by the examinations for teachers' certificates, consisted almost entirely of a fixed range of subjects in the fields of English, mathematics, science, history, and geography. From the beginning English was enthroned as the king of the subject-matter fields in territorial high schools. Almost invariably listed first in official programs, always obligatory, always an important part of the examination system, English continued as the main subject field throughout the history of the territorial high schools. In the earliest territorial high schools the English offering took the form of six courses in the teachers' nonprofessional program: literature, composition, grammar, dictation, reading, and writing. By the end of the territorial period the English subjects offered in each standard were reduced to four: reading, literature, composition, and grammar. Literature and composition, the examination subjects of standard six, emerged as the two main courses in the field. Grammar or rhetoric still survived as a separate examination course in standards seven and eight.

The literature course for standard six provides a good example of the approach to literature in territorial high schools. The policy was to prescribe a few poetical selections for intensive study. The memorization of "fine passages" was an important part of the program. The prescribed poems were almost always from the writings of the British poets of the Romantic and Victorian eras; Wordsworth and Tennyson were the favorites. Sometimes the selections would include a poem by the American poet Longfellow. For prose literature the prescribed selections were from the classics; for example, two plays by Shakespeare, or a novel by Scott. It was the custom to change each year the authorized poetical and prose selections of the literature course. In addition to the literature course with emphasis upon intensive study of a few prescribed selections, there was usually a reading course in which students were required to read extensively five classics. Longer poems, plays, and novels were the chief types.

Mathematics was a stable subject field in territorial high schools. Geometry and algebra were always on the list of subjects for each high school standard. In geometry the books of Euclid were studied. In algebra the main work was on equations, but the work was continued through progressions, series, and logarithms. Arithmetic

[6]Gerald Langley, "The Programme of Study Authorized for Use in the North-West Territories to 1905, and the Province of Saskatchewan to 1931, and the Textbooks prescribed for Use in Connection Therewith", pp. 105-108.

was an obligatory subject in the lower high school standards: *Hamblin Smith's Arithmetic* was the perennial textbook. A trigonometry course, which became a regular fixture in standard eight, completed the secondary school offering in the field of mathematics.

In contrast to the unchanging mathematics program, the science program underwent frequent changes in the territorial high schools. There was little science in the first union high school programs. The physiology offered in the high school rooms in Calgary in the school year 1890-91 was a semiprofessional course intended for prospective teachers. In that year physiology was the only science taught in the Roman Catholic Public Separate High School at Calgary. In the Calgary Protestant Public High School in the same year about one-third of the students were studying physiology, and a very small number of senior students were studying botany and chemistry. No natural science subject was included in the teachers' nonprofessional examinations written in midsummer 1893. The revised teachers' nonprofessional program announced in 1895 put more stress on science: botany and physics became examination subjects in all three standards, with chemistry as an additional science subject in standard eight. Three years later biology was added as another science subject in standard eight. In the revision announced in 1902 there was a complete rearrangement of the science offering, with botany and physics in standard six, animal life and chemistry in standard seven, and physics in standard eight.

.A great deal of the high school work in geography and history was a review and continuation of work covered in elementary school standards. The aim apparently was to prepare high school students to teach geography and history in the elementary schools. In standard six there was an intensive review of world geography, called "map geography generally." There was a special study of the geography of the British Empire. Physical geography was at first a part of the general course in geography, but towards the end of the territorial period was made a separate subject of study in standard seven. In the history course of standard six the work was largely a review of British and Canadian history. The stress was on military and political developments. In the upper high school standards the student might study some other phases of history: constitutional history of England and Canada, industrial history of England, or outlines of world history.

Foreign languages were offered but not stressed in territorial high schools. French and Latin were taught in the union high schools in Calgary. During the 1890's foreign languages declined in importance in territorial high schools, largely because they were not included in the teachers' academic program. Any work in the

foreign languages was usually determined by the matriculation requirements of the universities in Manitoba or Ontario. There was some revival of interest in foreign languages about 1902, when the new territorial program listed Latin, French, and German as official high school subjects, and permitted students to elect a foreign language in place of mathematics or science. The traditional grammar-translation method was commonly used in teaching foreign languages. The chief objectives were reading and writing skills, achieved through the close study of grammar and numerous translation exercises from English into the foreign language.

TABLE I

HIGH SCHOOL TEXTBOOKS
TERRITORIAL PERIOD 1889-1905*

| *Subject* | *Textbook* |
|---|---|
| Agriculture | Ontario Public School Agriculture |
| Botany | Spotton's Botany |
| Algebra | Ontario High School Algebra Part 1<br>C. Smith's Elementary Algebra |
| Arithmetic | Hamblin Smith's Arithmetic |
| Composition and Retoric | Welsh's Composition<br>Genung's Practical Elements of Rhetoric<br>Genung's Handbook of Rhetorical Analysis |
| Bookkeeping | McLean's High School Bookkeeping |
| Geography | The High School Geography<br>New Canadian Geography (N.W. edition)<br>Dawson and Sutherland's Geography of the British Colonies<br>Tarr's Elementary Physical Geography |
| Geometry | McKay's Euclid<br>Todhunter and Loney's Euclid |
| Grammar | Ontario Public School Grammar<br>Ontario High School Grammar<br>Seath's High School Grammar |
| History | Buckley and Robertson's High School History<br>Clement's History of Canada<br>Swinton's Outlines of World History<br>Bagehot's English Constitution<br>Bourinot's Constitutional History of Canada |
| Physics | Gage's Introduction to Physical Science |
| Chemistry | Kirkland's Experimental Chemistry |
| Trigonometry | Hamblin Smith's Trigonometry<br>Murray's Plane Trigonometry |

*Data from *Reports*, N.W.T—Board of Education, 1885-1891; Council of Public Instruction, 1896, 1898, 1900; Department of Education, 1901-1904. Only those books authorized for five years or more are included above.

There was a narrow range of vocational subjects offered in the territorial high schools. In addition to the teachers' professional courses already described, agriculture and bookkeeping were sometimes offered in the lower high school standards. The textbooks authorized largely determined the content of these courses. It must have been difficult to relate the Ontario agriculture textbook to farming and ranching conditions in the North-West.

There was a neglect of aesthetic elements in the territorial high school program. Music was never listed in the official high school programs announced by the central territorial authorities. Any music included in the program was offered through local initiative. For instance, Sister Greene taught vocal music in the high school department of the Separate School District in Calgary. The drawing course in the early territorial high schools was of the linear type with an abstract and geometric emphasis.

Textbooks played an important part in the secondary school sytem of the North-West Territories. High school courses were usually announced in terms of the content of a prescribed textbook. Only those texts prescribed by the central authorities could be used. Many of the texts authorized year after year became well-known. Table I gives the titles of the textbooks used for five years or more during the period in which public high schools were in operation in the North-West Territories.

### An Attempt to Introduce the Elective Principle

With the dawn of the new century the Government of the North-West Territories gave formal recognition to the increasing importance of public education. At the top school administrative level a fully organized and efficient Department of Education replaced the unwieldy Council of Public Instruction. At the level of secondary school curriculum the Department of Education announced a new high school program. It was significant that this program was announced as "The High School Program for Standards Six, Seven, and Eight." Previously the Council of Public Instruction had always announced all curriculum changes at the secondary school level under the title "Teachers' Non-professional Program for Certificates of the First, Second, and Third Class." This change of title was a formal recognition of the increasing importance of high school education as a preparation for citizenship on a broad basis.

D. J. Goggin, superintendent of schools for the North-West Territories, was mainly responsible for the revision of the high school program. Dr. Goggin was in favor of broader aims for secondary education. In his opinion the high school should amplify

the work of the elementary school and provide a broad preparation for life. Only in an incidental way should the high school prepare young people for admission to normal schools and colleges.[7]

In 1902 the Territorial Department of Education announced the high school curriculum as revised by Dr. Goggin. In this new program the Department attempted to introduce the elective principle by listing certain subjects as obligatory and others as optional, as shown in Table II.

TABLE II

PROGRAM OF STUDIES FOR THE HIGH SCHOOL, NORTH-WEST TERRITORIES, 1902*

*Standard six*

1. Reading
2. Composition
3. Literature
4. Grammar and Rhetoric
5. History
6. Geography
7. Arithmetic and Mensuration
8. Algebra
9. Geometry
10. Bookkeeping
11. Botany and Agriculture
12. Physics
13. Drawing
14. Latin
15. French
16. German

Obligatory subjects: 1, 2, 3, 4, 5, 6, 7, 8, 9, 11 (Botany), 13.
Optional subjects: 10, 11 (Agriculture), 12, 14, 15, 16.
Examination subjects for students intending to become teachers or enter a profession: 2, 3, 5, 6, 7, 8, 10, 11, 12, 13.

*Standard seven*

1. Reading
2. Composition
3. Literature
4. Grammar and Rhetoric
5. History
6. Geography
7. Algebra
8. Geometry
9. Animal life
10. Chemistry
11. Drawing
12. Latin
13. French
14. German

Obligatory subjects: 1, 2, 3, 4, 5, 6, 7, 8, 9, 11.
Optional subjects: 10, 12, 13, 14.
Examination subjects for students intending to become teachers or enter a profession: 2, 3, 4, 5, 6, 7, 8, 9, 10.
Electives: Latin instead of Algebra.
French or German instead of Grammar and Rhetoric or Chemistry.

*Standard eight*

1. Reading
2. Composition
3. Literature
4. Language and Rhetoric
5. History
6. Algebra
7. Geometry
8. Trigonometry
9. Physics
10. Latin
11. French
12. German

Obligatory subjects: 1, 2, 3, 4, 5, 9.
Optional subjects: 6, 7, 8, 10, 11, 12.
Exanmination subjects for students intending to become teachers or enter a profession: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.
Electives: Latin instead of Algebra.
French or German instead of Geometry or Trigonometry.

[7]Council of Public Instruction, N.W.T., **Report**, 1900, p. 26.

*Data from *Annual Report*, Department of Education, N.W.T., 1902, Appendix H.

The new territorial high school program announced in 1902 was acclaimed as a forward step in education because it introduced the elective principle. The principle was in accord with contemporary developments in curricula at the secondary and higher levels in other parts of the continent. The introduction of optional and elective subjects was a way of recognizing individual differences among students. It was a phase of the popularization of the high schools.

Although the theory of elective high school subjects seemed to conform to the main social trends of the time, there were serious limitations in the application of the theory in the high schools of the North-West Territories. In the first place, practically all the subjects, optional as well as obligatory, were of an academic nature. In the second place, the external examinations for students intending to become teachers or to enter a profession continued to exert a dominant influence on the instructional program organized by the principal of each high school. In the third place, the high schools of the North-West Territories were too small to permit extensive application of the theory of elective subjects; the largest high school departments in Calgary and Edmonton had only two or three staff members devoting their time exclusively to instruction at the high school level. For most students in the territorial high school the instructional program remained fixed and academic.

## Summary

Some significant precedents with respect to high school curriculum were established during the territorial period. One important development was adoption of centralized control, with prescription of the high school program by an agency of the territorial (later provincial) government. Another early development of considerable importance was the influence of the teachers' nonprofessional examinations in shaping the high school program. Later, after the formation of the province, admission requirements to provincial normal schools continued to be a major factor determining the type of program offered in high schools.

Curriculum construction in the territorial period was largely a matter of selecting and prescribing a series of textbooks. Many of the books selected were from those which had been published and authorized for use in Ontario.

A survey of the early high school curriculum points up certain changes that have taken place during the past half century. A characteristic feature of high school programs during the territorial period was the large number of subjects pursued by each student at a given time: a load of twelve or more subjects was the usual

practice. Since that time there has been a tendency to reduce, by integration or elimination, the number of such subjects. Another noticeable trend of the past half century has been the introduction of the elective principle, so that each high school student is no longer required to follow a fixed program, but may elect, within limits, from a wide and varied range of subjects.

## BIBLIOGRAPHY

Aylesworth, Nellie. "A History of the High School Courses of Study for Alberta." Unpublished Master's thesis, University of Alberta, 1936.

Bell, Walter. *The Development of the Ontario High School.* Toronto, University of Toronto Press, 1918.

Board of Education, North-West Territories. *Annual Reports,* 1885-1891. Regina, Printer to the Government of the North-West Territories. (Microfilm copies in the Rutherford Library, University of Alberta, Edmonton, Alberta.)

Council of Public Instruction, North-West Territories. Record Book, Non-professional Examinations, 1893-1902. (Manuscript document in the files of the Department of Education, Regina, Saskatchewan.)

Council of Public Instruction, North-West Territories. *Reports,* 1896, 1898, 1900. Regina, Printer to the Government of the North-West Terriories. (Copies in the Legislative Library, Edmonton, Alberta.)

Department of Education, North-West Territories. *Annual Reports,* 1901-1904. Regina, Printer to the Government of the North-West Territories. (Copies in the Legislative Library, Edmonton, Alberta.)

Kandel, I. L. *History of Secondary Education.* Boston, Houghton Mifflin Co., 1930.

Langley, Gerald. "The Programme of Study Authorized for Use in the North-West Territories to 1905, and the Province of Saskatchewan to 1931, and the Textbooks Prescribed for Use in Connection Therewith." Unpublished Master's thesis, University of Saskatchewan, 1944.

North-West Territories. *Ordinances,* 1888-1901.

# A NORMATIVE SURVEY OF READING ACHIEVEMENT OF ALBERTA CHILDREN IN RELATION TO INTELLIGENCE, SEX, BILINGUALISM, AND GRADE PLACEMENT*

William H. Coull
*Principal, Crestwood Elementary School, Edmonton*

## The Problem

Since 1880 more than twenty-seven hundred scientific studies related to reading have been published in the United States and England. During the last three decades an unprecedented interest in reading problems has resulted in a great increase in the number of investigations reported and in the range of problems studied. The ever-increasing body of knowledge of reading has brought about many changes in curricula and educational procedures.

In 1953 Dr. G. M. Dunlop and Dr. R. E. Rees of the Faculty of Education undertook the direction of a project to gather data concerning the language arts in Alberta schools. They worked with the assistance of the Research Committee of the University of Alberta and the approval of the Department of Education. Their efforts have resulted in the collection of data that have become useful in many studies in the language arts field.

The present study is but a small part of the provincial survey. Its general purpose is to contribute in some measure to the improvement of reading instruction. The recognition of individual differences emphasizes and demonstrates the importance to educational achievement of such factors as intelligence, sex differences and native language. The specific purposes of this study are to determine the relationship of intelligence, sex and bilingualism to reading achievement. An additional purpose is to present data that will determine the status of reading achievement of Alberta students in terms of grade placement.

## Experimental Design

The committee in charge of the project decided that a testing program in grades IV and VII would provide a body of data that would be useful in determining achievement of Alberta students in fields relating to language. The selection of pupils to be tested met the demands of random sampling in that every person in the population had an equal chance of being drawn.

*This study sponsored by the Alberta Committee on Educational Research.

In order to insure a balanced sample the province was divided into eight separate regions on the basis of geographic, socio-economic and language factors. From each of these areas one town was randomly selected in which the school population was between 250 and 1000. The selection of graded rural and ungraded rural samples from each of the eight divisions was roughly proportional to the total school population of the area. Graded rural children were randomly chosen from classrooms in towns having a school population less than 250. Of these, only children who were actually rural residents were used. The ungraded rural sample was obtained by testing children of randomly-chosen school divisions in each of the eight typical areas. All pupils in the grades concerned were tested and their papers randomly chosen by Faculty of Education workers. Edmonton and Lethbridge were randomly chosen to represent the large urban and small urban populations respectively.

The number of pupils tested for the reading survey appear in Table I.

TABLE I

SAMPLE SIZES OF PUPILS PARTICIPATING IN ALBERTA READING SURVEY

| Sample | Grade IV | Grade VII | Total |
|---|---|---|---|
| Large Urban | 196 | 197 | 393 |
| Small Urban | 150 | 149 | 299 |
| Town | 209 | 221 | 430 |
| Graded Rural | 215 | 161 | 376 |
| Ungraded Rural | 183 | 189 | 372 |
| Totals | 953 | 917 | 1,870 |

Detailed instructions regarding the administration of the tests were sent to the various teachers, principals and superintendents in order that testing procedures would be uniform. With the completion of the testing, all papers were returned to the University of Alberta where the Faculty of Education arranged to have them marked and the results recorded. Results were recorded on data assembly sheets and individual results were complied and recorded for each pupil tested.

In any testing program the selection of the testing instruments is of prime importance. Considerations must be given to the purposes of the program, the cost of test materials, the facility of

administration and the validity of results obtained. With these criteria in mind, the California Short-Form Test of Mental Maturity, Elementary (1950 S-Form), was chosen as a measure of intelligence; the Elementary and Intermediate Forms AA of the California Reading Test were chosen as measures of reading achievement.

In discussing the California Test of Mental Maturity, Garrett[1] indicates that validity is chiefly inferred, but a correlation of .88 with the Stanford Binet Test is stated for an unspecified level and range. No data are presented on the test's relationship to subsequent school achievement or to other appropriate criteria. Cattell[2], in discussing the California Test of Mental Maturity, says,

> These tests are exceedingly well designed from the point of view of adaptation to school needs and the convenience of the teacher. All the data regarding consistencies, standardization and correlation with school progress that one could reasonably demand, are clearly presented.

The authors of the California Reading Tests describe their tests as instruments for "accurately and objectively measuring pupil achievement in fundamental reading skills."[3] The reliability coefficients of the reading forms in terms of grade placement are .93 for the elementary test and .92 for the intermediate test.

As the authors give assurance that the California reading tests are but revisions of the Progressive Reading Test, Witty's[4] remarks should apply.

> The Elementary Reading Test is especially well-adapted for survey and diagnostic purposes . . . the results can be readily comprehended, interpreted and applied by classroom teachers.
>
> The tests in the Intermediate series appear to satisfy the criterion of validity . . . at present these tests have no equal as practical survey and diagnostic instruments.

Flanagan[5] concludes his evaluation of the California Reading Tests with the following statement.

> The California Reading Test is valuable for appraising the progress of pupils with respect to their important skills of vocabulary and comprehension.

In view of the fact that each of the California tests requires less than an hour to administer it appears that they meet the criterion of time economy. The organization of material and provision of diagnostic or analytic features make them especially valuable to the teacher or administrator. It would seem that these testing instruments satisfy the demands of the survey.

In the statistical treatment of the data the relationship between Total I.Q. and Total Reading scores was determined by the cal-

---

1Henry E. Garrett, **The Third Mental Measurements Yearbook**, p. 224.

2Raymond B Cattell, **The Nineteen Forty Mental Measurements Yearbook**, pp. 1193-94.

3**Manual, California Reading Test**, p. 2.

4P. A. Witty, **Third Mental Measurements Yearbook**, p. 15.

5J. C. Flanagan, **Fourth Mental Measurements Yearbook**, pp. 568-570.

culation of the product-moment coefficients of correlation. The data used were drawn from five stratified samples of grade VII Alberta pupils. In order to evaluate the reliability of the coefficients of correlation obtained they were tested against the null hypothesis. Computed values were used to determine significance of differences between coefficients of correlation.

Comparison of boys and girls of grade seven in intelligence and reading achievement was made on the basis of 400 randomly-chosen scores. Frequency distributions were compiled for the Total I.Q. and Total Reading scores. The arithmetic means, standard deviations, and standard errors were computed.

The significance of mean differences between boys' and girls' scores was tested by computing the mean differences, the standard errors of the differences and the critical ratios. To test the significance of the computed critical ratios reference was made to a table of significance of statistics of small samples. The null hypothesis was retained for critical ratios less than 2.58 at the .01 level of confidence and for critical ratios less than 1.96 at the .05 level.

Variability from sample to sample was determined by the calculation of standard deviations, differences in standard deviations and critical ratios obtained from these differences. Critical ratios were subjected to the test of the null hypothesis for significance of difference. Bilingual samples were compared in a similar manner.

The means and standard deviations of each sample in grades IV and VII were combined for reading vocabulary totals, reading comprehension totals and total reading. The corresponding grade score for each mean score was determined from the test manuals. The yearly increment was computed by dividing the grade score obtained by the grade level at time of testing.

## Reading Achievement and Intelligence

A relationship between reading ability and intelligence has long been recognized. Dolch[6] says, "The strongest single factor in the pupil's success in reading is undoubtedly his degree of intelligence." This study attempts to obtain some measure of the relationship between reading achievement and intelligence test scores for Alberta students at the grade VII level.

The coefficients of correlation between reading achievement scores and intelligence test scores range from + .67 to +.81. The computed coefficients of correlation and corresponding probable

[6]Edward W. Dolch, **The Psychology and Teaching of Reading**, p. 139.

errors of the coefficient appear in Table II for each of the five samples tested.

TABLE II

CORRELATION BETWEEN READING ACHIEVEMENT AND INTELLIGENCE OF FIVE SUBSAMPLES OF GRADE VII ALBERTA STUDENTS

| Sample | N | r | $PE_r$ |
|---|---|---|---|
| Large Urban | 196 | .81 | 0.02 |
| Small Urban | 145 | .67 | 0.03 |
| Town | 218 | .74 | 0.02 |
| Graded Rural | 190 | .69 | 0.03 |
| Ungraded Rural | 185 | .71 | 0.03 |

The reliability of a coefficient of correlation may be tested against the null hypothesis that the computed coefficient does not depart significantly from zero. In the formula

$$t = \frac{r\sqrt{N-2}}{\sqrt{1-r^2}}$$

$r$ represents the coefficient of correlation, and N is the size of the sample.[7] The $t$ values were computed for each of the five subsamples. It was found that each coefficient of correlation was highly significant at the .01 level, making it necessary to reject the null hypothesis and thereby establishing the fact that the coefficients do depart from zero.

As a test of the reliability of the difference between coefficients of correlation, the significance of the difference between coefficients was computed. By a comparison of the $t$ values obtained with those of the table of $t$, it is possible to test the hypothesis that the five sample values of $r$ are drawn from the same population. Table III reveals significant differences between large urban and small urban samples at the .01 level of confidence.

A similar significant difference may be noted between the large urban and graded rural samples. As all five samples were randomly drawn from the grade VII Alberta population, any difference in the relationship between intelligence and reading achievement would normally result from causes other than those of sampling.

[7]Henry E. Garrett, **Statistics in Psychology and Education**, p. 298.

TABLE III

COMPARISON OF COEFFICIENTS OF CORRELATION BY THE USE OF FISHER'S Z FUNCTION

| | Large Urban | Small Urban | Town | Graded Rural |
|---|---|---|---|---|
| Ungraded Rural | 2.4 | 0.73 | 0.6 | 0.4 |
| Large Urban | ..... | 2.91* | 1.0 | 2.75* |
| Small Urban | ..... | ..... | 1.27 | 0.36 |
| Town | ..... | ..... | ..... | 1.01 |

*Significant at the .01 level.

The findings of relationship between reading achievement and intelligence would appear to corroborate the findings of others in this field. Significant differences that exist between some of the samples do not appear to be attributable to sampling errors. Differences in school organization, administrative and supervisory practices, instructional procedures or subject emphasis may account for the range of correlation coefficients. The finding indicates that the subject warrants further study.

## Sex Differences

A review of the literature regarding sex differences reveals a superiority of girls in language arts. On the basis of the superiority displayed by girls in reading readiness tests, Anderson and Dearborn[8] suggest that the general factor of rate of maturity is at work favoring girls, and that the difference is not referable to specific language entities. The additional fact, as found by Stroud and Lindquist[9], that differences appear early and tend to disappear as the child grows older lends further support to the contention.

The selection of subjects in this study was made to conform to the criterion of randomness. Two hundred boys and two hundred girls from grade VII were chosen and their scores on the California Test of Mental Maturity and the California Reading Tests used for statistical treatment.

[8]Irving H. Anderson and Walter F. Dearborn, **The Psychology of Teaching Reading**, p. 35.

[9]J. B. Stroud and E. F. Lindquist, "Sex Differences in Achievement in the Elementary and Secondary Schools", **Journal of Education Psychology XXXIII**, pp. 657-667.

Table IV compares the mean scores obtained on both tests.

TABLE IV

COMPARISON OF MEAN SCORES IN INTELLIGENCE AND READING OF GRADE VII BOYS AND GIRLS

| | N | Total I. Q. | Total Reading |
|---|---|---|---|
| Boys | 200 | 102.90 | 91.85 |
| Girls | 200 | 103.78 | 93.65 |

To determine whether the above differences were significant the critical ratios were computed and appear in Table V.

TABLE V

SIGNIFICANCE OF DIFFERENCES OF MEAN SCORES IN INTELLIGENCE AND READING OF GRADE VII BOYS AND GIRLS

| Scores | D | $SE_D$ | CR |
|---|---|---|---|
| Total I.Q. | 0.88 | 1.37 | 0.64 |
| Total Reading | 1.80 | 1.71 | 1.05 |

The critical ratio of the 0.64 for Total I.Q. and 1.05 for Total Reading are found to be non-significant. It would appear that no significant difference exists between the sexes in intelligence or reading achievement at the grade seven level.

Assuming that the size of the boys' and girls' samples is large enough to ensure the reliability of the means of boths tests, the factor of variability of the measures about the mean must be considered. A comparison of the standard deviations computed for both tests appear in Table VI.

TABLE VI

COMPARISON OF STANDARD DEVIATION FOR BOYS AND GIRLS

| | N | Total I.Q. | Total Reading |
|---|---|---|---|
| Boys | 200 | 14.53 | 18.24 |
| Girls | 200 | 12.88 | 15.82 |

A critical ratio of 1.70 was obtained when the significance of the difference between standard deviations of total intelligence scores of boys and girls was tested. As this value is not great enough to indicate a significant difference the means may be accepted as stated. A computed critical ratio of 2.00 is significant at the .05 level for existing differences in Total Reading. To further test the significance of the difference between means when the variances are not homogeneous the approximate method described by Johnson[10] was applied. A critical ratio of 1.05 was computed, which is not significant at the .05 level. This finding would seem to reaffirm the validity of the computed means as measures of central tendency despite the presence of heterogeneity among the variance. The conclusion that no significant difference exists between boys' and girls' total reading scores at the grade VII level may be safely retained.

## Bilingualism

Bilingualism has been recognized as a factor in the measurement of scholastic achievement. Various studies undertaken in Alberta offer evidence that bilingual pupils suffer a handicap when tested by verbal tests in English. Language studies indicate that the bilingual factor decreases in importance as a pupil proceeds from grade I to grade XII. In view of this observation the grade VII sample was chosen for study because of its intermediate position.

A random sample of 200 pupils who listed English as the preferred language was selected from the grade VII population. It was found that of the 917 grade VII candidates only 131 listed a language other than English as the preferred language spoken in the home. A comparison of the mean Total I.Q. scores and the mean Total Reading scores for these two groups appears in Table VII.

TABLE VII
COMPARISON OF MEAN TOTAL I.Q. SCORES AND TOTAL READING SCORES FOR MONOGLOT AND BILINGUAL SAMPLES

| Samples | N | Total I. Q. | Total Reading |
|---|---|---|---|
| Monoglot | 200 | 105.10 | 95.35 |
| Bilingual | 131 | 95.44 | 83.75 |

A difference between the means of intelligence scores was found to be 9.66. To determine the significance of the mean difference the critical ratio was computed.

[10]Palmer O. Johnson, **Statistical Methods in Research**, pp. 74-5.

TABLE VIII
SIGNIFICANCE OF DIFFERENCE OF TOTAL I.Q. MEAN SCORES OF MONOGLOT AND BILINGUAL PUPILS

| Scores | D | $SE_D$ | CR |
|---|---|---|---|
| Total I.Q. | 9.66 | 1.45 | 6.66 |

The critical ratio of 6.66 is significant at the .01 level of confidence.

In reading achievement the monoglot sample manifests a superiority of 11.60 over the bilingual group. In order to test the significance of this difference the critical ratio was computed and appears below.

TABLE IX
SIGNIFICANCE OF DIFFERENCE OF MEAN TOTAL READING SCORES FOR MONOGLOT AND BILINGUAL SAMPLES

| Scores | D | $SE_D$ | CR |
|---|---|---|---|
| Total Reading | 11.60 | 1.92 | 6.04 |

A critical ratio of 6.04 is found to be significant at the .01 level.

In order to determine whether the variability factors affected the reliability of the computed means of the Total I.Q. scores and the Total Reading scores, the significance of the differences of standard deviations was computed. The results are summarized in Table X.

TABLE X
SIGNIFICANCE OF DIFFERENCE OF STANDARD DEVIATIONS FOR TOTAL I.Q. AND TOTAL READING SCORES OBTAINED BY MONOGLOT AND BILINGUAL PUPILS

| Scores | D | $SE_D$ | CR |
|---|---|---|---|
| Total I. Q. | 0.43 | 1.03 | 0.42 |
| Total Reading | 2.48 | 1.35 | 1.84 |

A critical ratio of 0.42 for Total I.Q. and 1.84 for Total Reading are found to be non-significant. It would appear that variability does not affect the reliability of the computed mean scores.

The findings of this study would indicate that the pupil with a bilingual background is more difficult to measure in terms of I.Q. scores of an English group intelligence test. The bilingual pupil fails to achieve comparable scores in a test of reading achievement.

### Reading Achievement and Grade Placement

To determine the status of reading achievement in the province the data for each subsample, as found by Carmichael[11], were combined and the equivalent grade scores computed. A summary of these findings appears in Table XI.

TABLE XI

COMBINED MEANS, STANDARD DEVIATIONS AND CORRESPONDING GRADE SCORES OF ALBERTA READING SCORES

| Test | Grade | M | $SD_M$ | Grade Score in years | Average Yearly Increment |
|---|---|---|---|---|---|
| Reading Vocabulary Total | IV | 68.7 | 12.15 | 5.2 | 1.06 |
| | VII | 57.03 | 11.64 | 7.9 | 1.0 |
| Reading Comprehension Total | IV | 25.17 | 6.16 | 5.4 | 1.1 |
| | VII | 34.65 | 7.61 | 7.8 | .99 |
| Total Reading | IV | 93.90 | 15.91 | 5.3 | 1.08 |
| | VII | 91.61 | 18.19 | 7.9 | 1.0 |

Observation of the data for the grade IV sample indicates that achievement is somewhat superior to the normal for the grade placement of the ninth month in grade IV. Grade VII achievement would seem to be quite normal except for a slight inferiority in reading comprehension. Yearly progress in reading would appear to be quite normal. Gains in achievement from grade IV to grade VII are shown in Table XII.

The gain in terms of grade score in each of the sections of the test is less than three years. It would appear that a deceleration in reading achievement takes place from grade IV to grade VII.

[11]Anne Carmichael, **A Survery of the Achievement of Alberta School Children in Reading.**

TABLE XII

GROWTH IN READING ACHIEVEMENT IN TERMS OF GRADE PLACEMENT FROM GRADE FOUR TO GRADE SEVEN

| Reading | Grade IV | Grade VII | Growth |
|---|---|---|---|
| Vocabulary | 5.2 | 7.9 | 2.7 |
| Comprehension | 5.4 | 7.8 | 2.4 |
| Total Reading | 5.3 | 7.9 | 2.6 |

## Conclusions

The purpose of this survey was to organize a body of data sufficient to make observations regarding reading achievement of Alberta pupils in regard to intelligence, sex, bilingualism and grade placement. A summary of conclusions follows.

1. A significant relationship between reading achievement and intelligence exists. High positive correlations of from .67 to .81 were obtained when pupils' abilities were compared, using scores on the California Short-Form Test of Mental Maturity and the California Reading Test, Intermediate, Form AA.

2. Examination of the relationship between intelligence and reading achievement indicates that factors are present which produce significant differences between certain of the coefficients of correlation. Correlation coefficients for the large urban sample were significantly greater than those of the small urban, the graded rural, or the ungraded rural samples.

3. Measurement by the California Short-Form Test of Mental Maturity reveals no significant sex differences in intelligence of Alberta children.

4. No significant sex differences in reading achievement of Alberta pupils at the grade VII level exist when measurement is made by the California Reading Test, Intermediate, Form AA.

5. In the measurement of reading achievement of boys and girls significant differences in variability do not limit the reliability of the computed mean scores.

6. Children from homes in which English was the preferred language were found to score significantly higher on tests of intelligence than those from bilingual homes.

7. A comparison of English and Bilingual samples for reading achievement favors the pupils from monoglot homes in which English is the language spoken.

8. Reading achievement for the Alberta grade IV sample is superior to the norms of the California Reading Test, Form AA, in terms of grade scores.

9. The Alberta grade VII sample equalled the reading achievement that might be expected in terms of grade score norms of the California Reading Test.

10. On the basis of a naive examination of grade scores of Alberta pupils, a deceleration in growth of reading ability is indicated between grades IV and VII.

## Implications

1. The high correlation between intelligence and reading achievement indicates the presence of a common factor of language. Pupils with reading or language disabilities suffer a disadvantage in such measurement. A non-verbal or performance intelligence test might be used to supplement results of verbal intelligence tests of the reading deviate or of the bilingual pupil.

2. Measures of mental maturity may serve as a guide to the reading potential of a student.

3. As no significant differences in reading achievement were found between boys and girls, comparable achievement should be expected in the classroom. Further research in the fields of interest, motivation and subject matter might reveal sex differences of importance for instructional procedures.

4. Since bilingual children suffer a very definite handicap in reading, a program of remedial reading appears to be needed. The problem of bilingualism and scholastic achievement requires further study.

5. Research is needed to determine the causes of the apparent deceleration in reading growth between grades IV and VII.

## BIBLIOGRAPHY

Anderson, Irving H. and Dearborn, Walter F. *The Psychology of Teaching Reading.* New York, The Ronald Press, 1952.

Carmichael, Anne. *A Survey of the Achievement of Alberta School Children in Reading.* Unpublished Master's thesis, The University of Alberta, 1954.

Cattell, Raymond B. "Review of California Short-Form Test of Mental Maturity." *The Nineteen Forty Mental Measurements Yearbook.* Highland Park, N. J., Rutgers University Press, 1940.

Dolch, Edward W. *The Psychology and Teaching of Reading.* New York; Ginn and Company, 1931.

Flanagan, J. C. *The Fourth Mental Measurement Yearbook.* Highland Park, N.J., The Gryphon Press, 1953.

Garrett, Henry G. *The Third Mental Measurements Yearbook,* 1941.

Johnson, Palmer O. *Statistical Methods in Research.* New York, Prentice-Hall, 1949.

Stroud, J. B. and Lindquist, E. F. "Sex Differences in Achievement in the Elementary and Secondary Schools." *Journal of Educational Psychology* XXXIII (1942), pp. 657-667.

Witty, Paul A. *Third Mental Measurements Yearbook,* 1941.

# A CRITICAL EVALUATION OF THE DETROIT BEGINNING FIRST GRADE INTELLIGENCE TEST

FREDERICK POWELL
*Dewberry, Alberta*

An intelligence test is a measuring instrument. Like every measuring instrument it may have flaws in its structure due to theoretical misconceptions or it may be subject to errors of administration that detract from its usefulness.[1]

In the evaluation of any psychometric instrument, four properties must receive consideration. These are objectivity, reliability, validity, and standardization of the test or test battery. This study undertakes to present an evaluation of the Detroit Beginning First Grade Intelligence Test in the above terms.

## Validity

The validity of a test may be determined by the use of an external criterion and by the criterion of internal consistency. When an external criterion is used, two groups known to differ with respect to the properties being measured are tested, and the performance of each group on each item is determined. The test will be deemed valid if it shows a satisfactory degree of discrimination between the two groups. This was presumably the method used by the authors of the Detroit Beginning First Grade Intelligence Test in the validation procedure described in the test manual. Here a correlation of .76 is reported between the Stanford-Binet mental ages and the weighted scores of 116 first-grade children. During the process of analyzing a sample of 1,838 Detroit Beginning First Grade Intelligence Test scores from the Edmonton public school system of 1948 there were found 159 cases of beginners who had taken both the Detroit Beginning First Grade Intelligence Test and the Kuhlmann-Anderson[2] group intelligence test of the appropriate level. The correlation of the Detroit Beginning and the Kuhlmann-Anderson was found to be .54.

In practice it is not always easy to find clear-cut criterion groups differing only in the experimental variable, so an internal criterion is often used. In using the criterion of internal consistency we may set up the extreme portions of a group who have taken a test as

---

[1]Anna M. Engel and Harry J. Baker, Detroit Beginning First Grade Intelligence Test (Revised).

[2]F. Kuhlmann and R. G. Anderson, Kuhlmann-Anderson Intelligence Tests (Fifth Edition).

criterion groups. In Lawshe's[3] method the highest and lowest 25 per cent are used. In Flanagan's[4] and in Davis's[5] method the highest and lowest 27 per cent are used.

The percentage of successes in the upper and in the lower 27 per cent of a sample of 250 cases from the Vermilion S.D. No. 25 for the year 1951 were computed and are given in Table I. Discrimination indices as computed by the above three methods are given in Table II.

TABLE I

PERCENTAGE OF SUCCESS IN UPPER AND LOWER TWENTY-SEVEN PER CENT OF VERMILION SAMPLE

| Item | Per Cent High | Per Cent Low | Item | Per Cent High | Per Cent Low |
|---|---|---|---|---|---|
| I 1 | 94.1 | 84.8 | VI 1 | 100.0 | 70.0 |
| 2 | 100.0 | 84.8 | 2 | 100.0 | 66.2 |
| 3 | 97.0 | 79.4 | 3 | 98.5 | 55.5 |
| 4 | 64.7 | 44.1 | 4 | 91.1 | 32.3 |
| | | | 5 | 75.0 | 36.8 |
| II 1 | 100.0 | 92.6 | 6 | 60.3 | 8.8 |
| 2 | 98.5 | 83.8 | 7 | 69.1 | 23.5 |
| 3 | 88.2 | 51.5 | | | |
| 4 | 94.1 | 48.5 | VII 1 | 95.6 | 60.3 |
| 5 | 91.1 | 58.5 | 2 | 94.1 | 39.2 |
| 6 | 89.4 | 44.1 | 3 | 98.5 | 55.9 |
| 7 | 64.7 | 25.2 | 4 | 91.1 | 17.6 |
| | | | 5 | 97.0 | 41.2 |
| III 1 | 98.5 | 61.7 | 6 | 57.3 | 1.5 |
| 2 | 97.0 | 66.2 | 7 | 85.3 | 7.4 |
| 3 | 98.5 | 50.0 | | | |
| 4 | 98.5 | 52.9 | VIII 1 | 97.0 | 73.5 |
| 5 | 77.9 | 22.1 | 2 | 98.5 | 61.7 |
| 6 | 95.6 | 41.2 | 3 | 94.1 | 38.2 |
| 7 | 91.1 | 33.8 | 4 | 77.9 | 17.6 |
| | | | 5 | 58.8 | 4.4 |
| IV 1 | 98.5 | 85.3 | | | |
| 2 | 98.5 | 77.9 | IX 1 | 100.0 | 63.2 |
| 3 | 100.0 | 75.0 | 2 | 92.6 | 29.4 |
| 4 | 95.6 | 61.7 | 3 | 76.4 | 26.5 |
| 5 | 98.5 | 29.4 | 4 | 61.7 | 10.3 |
| 6 | 97.0 | 45.6 | | | |
| 7 | 76.4 | 11.8 | X 1 | 100.0 | 95.6 |
| | | | 2 | 100.0 | 85.3 |
| V 1 | 100.0 | 100.0 | 3 | 91.1 | 48.5 |
| 2 | 98.5 | 95.6 | 4 | 98.5 | 51.5 |
| 3 | 98.5 | 94.1 | 5 | 83.8 | 25.0 |
| 4 | 97.0 | 85.3 | | | |
| 5 | 100.0 | 61.7 | | | |
| 6 | 98.5 | 69.1 | | | |
| 7 | 95.6 | 88.2 | | | |

[3]Charles H. Lawshe, **Principles of Personnel Testing,** pp. 177-191.

[4]J. C. Flanagan, "General Considerations in the Selection of Test Items", **Journal of Educational Psychology XXX** (December, 1939), pp. 674-680.

[5]**Frederick B. Davies, Item-Analysis Data, pp. 8-15.**

TABLE II

DISCRIMINATION VALUES OF ITEMS IN DETROIT BEGINNING FIRST GRADE INTELLIGENCE TEST

| Item | $D_F$ | $D_L$ | $D_D$ | Item | $D_F$ | $D_L$ | $D_D$ |
|---|---|---|---|---|---|---|---|
| I 1 | .20 | .5 | 14 | VI 1 | .70 | 1.9 | 44 |
| 2 | .55 | 1.3 | 32 | 2 | .73 | 2.0 | 47 |
| 3 | .40 | 1.2 | 36 | 3 | .74 | 2.1 | 52 |
| 4 | .23 | .5 | 13 | 4 | .63 | 1.8 | 44 |
| | | | | 5 | .40 | 1.0 | 25 |
| II 1 | .35 | .9 | 22 | 6 | .60 | 1.6 | 38 |
| 2 | .50 | 1.2 | 37 | 7 | .46 | 1.0 | 29 |
| 3 | .45 | 1.1 | 28 | | | | |
| 4 | .55 | 1.6 | 38 | VII 1 | .60 | 1.5 | 37 |
| 5 | .45 | 1.1 | 27 | 2 | .62 | 1.9 | 45 |
| 6 | .53 | 1.3 | 33 | 3 | .68 | 2.0 | 52 |
| 7 | .42 | 1.1 | 27 | 4 | .73 | 2.1 | 53 |
| | | | | 5 | .67 | 2.1 | 52 |
| III 1 | .70 | 2.0 | 43 | 6 | .75 | 2.3 | 38 |
| 2 | .55 | 1.4 | 31 | 7 | .77 | 2.6 | 59 |
| 3 | .70 | 2.2 | 55 | | | | |
| 4 | .70 | 2.1 | 54 | VIII 1 | .45 | 1.2 | 30 |
| 5 | .55 | 1.5 | 38 | 2 | .65 | 1.9 | 49 |
| 6 | .65 | 2.2 | 55 | 3 | .64 | 1.9 | 46 |
| 7 | .62 | 1.8 | 43 | 4 | .60 | 1.7 | 42 |
| | | | | 5 | .68 | 2.0 | 48 |
| IV 1 | .50 | 1.3 | 31 | | | | |
| 2 | .55 | 1.5 | 37 | IX 1 | .72 | 2.1 | 49 |
| 3 | .65 | 1.7 | 40 | 2 | .68 | 2.0 | 50 |
| 4 | .55 | 1.5 | 40 | 3 | .52 | 1.3 | 35 |
| 5 | .80 | 2.9 | 68 | 4 | .56 | 1.6 | 39 |
| 6 | .68 | 2.0 | 54 | | | | |
| 7 | .66 | 1.9 | 48 | X 1 | .30 | .7 | 14 |
| | | | | 2 | .50 | 1.5 | 31 |
| V 1 | .00 | 0.0 | 0 | 3 | .51 | 1.4 | 33 |
| 2 | .20 | .5 | 14 | 4 | .76 | 2.2 | 64 |
| 3 | .30 | .6 | 19 | 5 | .59 | 1.7 | 41 |
| 4 | .35 | .9 | 28 | | | | |
| 5 | .75 | 2.0 | 49 | | | | |
| 6 | .65 | 1.7 | 44 | | | | |
| 7 | .25 | .5 | 21 | | | | |

The index of discrimination in column $D_F$ has been computed by the Flanagan method, that in column $D_L$ by the Lawshe method, and that in column $D_D$ by the Davis method.

Only one item, V 1, shows zero index of discrimination. All the others are positive. All three methods, then, show that the items in the Detroit Beginning First Grade Intelligence Test do discriminate between the higher and lower levels of ability. If a greater degree of discrimination were desired the procedure would be to remove items of low discrimination from the test and add others of a higher index value.

The three methods used in this item analysis were compared by means of the rank correlation coefficient, which is an appropriate statistic where the ranking or relative order of scores is important. The correlation of the ranking of the discriminatory power of the items by Flanagan's method vs. Lawshe's method was computed to be .98, of Lawshe's vs. Davis's. 98, and of Flanagan's vs Davis's .99.

It would, therefore, appear that the Detroit Beginning First Grade Intelligence Test has been carefully constructed in terms of the discriminatory power of the items, and is in this respect a valid test. Fifty-nine of the sixty items discriminate effectively between the children scoring highest and lowest on the total test.

## Reliability

The consistency with which a test measures is indicated by its reliability coefficient. There are three types of reliability coefficient: first, the coefficient of equivalence, which indicates how much scores fluctuate from form to form of the same test; second, the coefficient of stability, which measures the extent of fluctuations on the same questions from one time to another, third, the coefficient of stability and equivalence which takes into account both the time-to-time variations and the form-to-form variations in test performance.

In the derivation of the coefficient of stability the same test is given after an interval of time to the same group and the results correlated. The manual of the Detroit Beginning First Grade Intelligence Test cites a reliability coefficient of .76 based on a retest of 407 cases after a four month interval.

In a case such as the Detroit Beginning First Grade Intelligence Test where there is no alternative form the coefficient of equivalence may be estimated by the split-half method or by the Kuder-Richardson formula. The split-half technique was used to derive a reliability coefficient from the unweighted scores of a sample of 65 cases comprising the entire beginning first grade class from the town of Vermilion in the fall of 1951. The result was a reliability coefficient of .89 when corrected by the Spearman-Brown formula. The split-half method was used by the authors to derive a reliability coefficient from the administration of the test to an unselected group of 116 first grade children using weighted scores. The result was a reliability coefficient of .91 when corrected by the Spearman-Brown formula.

Using the item analysis date for the 250 cases of the Vermilion distribution, a reliability coefficient may be derived using the Kuder-Richardson formula. In this formula, $r = \frac{n}{n-1}\left(\frac{1-pq}{s^2}\right)$,

$n$ is 60, $s$ is 10.2 and the sum of pq is 9.784. Substituting in the formula we get a reliability coefficient of .91.

The closeness of correspondence between these different coefficients of reliability would indicate that the chance score on this tests is not considerable. The probability of a pure chance score on this test has not been computed, but quick examination of the nature of the items will reveal why it cannot be high. This is the multiple response required for many items, which reduces the probability of guessing the correct answer.

## Standardization

The revised norms for the Detroit Beginning First Grade Intelligence Test for the year 1945 were computed from the weighted scores of 37,996 first grade pupils. Some effort was made during the progress of this study to investigate the averages of a much smaller sample of 4,402 Alberta school children. These averages are given in Table III with the standard deviations and Pearson's coefficient of skewness.

TABLE III

STATISTICAL ANALYSIS OF DETROIT BEGINNING FIRST GRADE INTELLIGENCE TEST SCORES FROM THE SCHOOL SYSTEMS OF EDMONTON, WESTLOCK, AND VERMILION

| School System | Year | N | Mean Age in Months | S.D. Of Age | Mean Score | S.D. Of Score | Skewness (Pearson) |
|---|---|---|---|---|---|---|---|
| Edmonton | 1948 | 1838 | 73.44 | 4.07 | 62.28 | 18.44 | —.53 |
| Edmonton | 1949 | 2144 | 73.82 | 4.32 | 63.71 | 18.00 | —.46 |
| Westlock | 1950 | 170 | 76.09 | 6.59 | 64.80 | 17.05 | —.78 |
| Vermilion | 1951 | 250 | 75.83 | 5.14 | 66.62 | 18.55 | —.56 |
| Combined | | 4402 | 73.87 | 4.52 | 63.32 | 18.20 | —.48 |

It might seem worth while to develop local norms on the basis of this total sample of 4,402 and to compare them with the Detroit norms, but there are difficulties in the way of accomplishing this—one of which is apparent in the table, and one which is not. An examination of Table III will reveal that all the separate distributions of scores and the total distribution are skewed. A second important fact about these distributions is that they are select rather than random samples, composed of the children who begin school about the age of six years and two months. Evidence to this effect is

found in Table IV. The mean scores was computed for each month in the range where there were sufficient cases to provide an adequate sample.

TABLE IV

MEAN SCORES FOR EACH MONTH OF CHRONOLOGICAL AGE FOR AGES FROM 66 TO 84 MONTHS

| Age | N | Mean Score | Age | N | Mean Score |
|---|---|---|---|---|---|
| 66 | 39 | 58.2 | 76 | 381 | 66.5 |
| 67 | 197 | 54.5 | 77 | 350 | 67.8 |
| 68 | 223 | 58.0 | 78 | 278 | 69.1 |
| 69 | 287 | 57.2 | 79 | 168 | 67.4 |
| 70 | 340 | 60.4 | 80 | 136 | 66.8 |
| 71 | 404 | 58.4 | 81 | 81 | 63.0 |
| 72 | 352 | 62.8 | 82 | 43 | 65.3 |
| 73 | 330 | 62.8 | 83 | 38 | 72.4 |
| 74 | 350 | 66.4 | 84 | 21 | 60.3 |
| 75 | 322 | 66.1 | ..... | ..... | ..... |

The 4,320 cases in the above table are from the school systems of Edmonton, Vermilion, and Westlock. It will be noted that there is a fairly uniform trend toward increase in score with increase in chronological age from 66 months to 78 months. After the age of 78 months the scores begin to decline and to scatter. This must be due to a selective factor in the population under study: it cannot be due to an educational factor, since all cases are beginners. It is this selective factor which vitiates the sample for the derivation of norms. The most obvious explanation of the decline in score of the higher age groups is that the latter cases in the sample are a more slowly maturing group who have been kept in the home by the parents till they develop sufficiently to cope with the intellectual work of the school. For the group from ages 78 to 84 months the correlation between age and score is —.37, showing a decrease in performance with increase in chronological age.

The statistics computed for the distributions in Table III are essential for the understanding of a distribution of scores. Nevertheless there are important questions which may not be answered from an isolated study of these statistics. The Detroit is a beginner's test, but is its range of difficulty well adjusted to the capabilities of the age group who take the test in Alberta schools?

Evidence was obtained from an analysis of the item difficulty for the Vermilion sample that the range of difficulty of the items is less than the theoretical maximum. This evidence will now be reviewed.

TABLE V

PERCENTAGE OF CORRECT RESPONSES WITH CORRESPONDING SIGMA SCORES FROM AN ARBITRARY ZERO VALUE OF —3 COMPUTED FROM VERMILION SAMPLE

| Item | Per Cent Correct | Sigma Score | Item | Per Cent Correct | Sigma Score |
|---|---|---|---|---|---|
| I 1 | 90.8 | 1.67 | VI 1 | 88.4 | 1.99 |
| 2 | 91.2 | 1.65 | 2 | 90.0 | 1.72 |
| 3 | 89.6 | 1.74 | 3 | 80.4 | 1.69 |
| 4 | 54.4 | 2.89 | 4 | 65.6 | 2.60 |
| | | | 5 | 55.2 | 2.87 |
| II 1 | 96.4 | 1.20 | 6 | 36.0 | 3.36 |
| 2 | 89.6 | 1.74 | 7 | 42.0 | 2.80 |
| 3 | 66.4 | 2.58 | | | |
| 4 | 72.0 | 2.42 | VII 1 | 80.0 | 2.16 |
| 5 | 76.0 | 2.29 | 2 | 69.2 | 2.50 |
| 6 | 64.4 | 2.63 | 3 | 76.8 | 2.27 |
| 7 | 46.0 | 3.10 | 4 | 61.2 | 2.72 |
| | | | 5 | 74.8 | 2.33 |
| III 1 | 86.8 | 1.88 | 6 | 24.8 | 3.67 |
| 2 | 82.2 | 2.08 | 7 | 47.6 | 3.08 |
| 3 | 84.0 | 2.01 | | | |
| 4 | 82.0 | 2.08 | VIII 1 | 88.4 | 1.80 |
| 5 | 53.2 | 2.92 | 2 | 86.0 | 1.92 |
| 6 | 76.8 | 2.29 | 3 | 72.8 | 2.39 |
| 7 | 61.2 | 2.72 | 4 | 45.2 | 3.12 |
| | | | 5 | 27.2 | 3.61 |
| IV 1 | 95.6 | 1.29 | | | |
| 2 | 91.2 | 1.65 | IX 1 | 86.0 | 1.92 |
| 3 | 91.2 | 1.65 | 2 | 63.6 | 2.65 |
| 4 | 82.4 | 2.07 | 3 | 53.2 | 2.66 |
| 5 | 65.6 | 2.60 | 4 | 27.2 | 3.61 |
| 6 | 74.0 | 2.36 | | | |
| 7 | 40.0 | 3.25 | X 1 | 96.8 | 1.15 |
| | | | 2 | 93.6 | 1.48 |
| V 1 | 100.0 | 0.00 | 3 | 66.6 | 2.58 |
| 2 | 97.6 | 1.02 | 4 | 72.0 | 2.42 |
| 3 | 96.0 | 1.25 | 5 | 50.4 | 2.99 |
| 4 | 94.4 | 1.41 | | | |
| 5 | 82.4 | 2.07 | | | |
| 6 | 84.4 | 1.80 | | | |
| 7 | 93.6 | 1.48 | | | |

*Is the Detroit Beginning First Grade Intelligence Test too easy for the age group to which it is being administered in Alberta?*

The number and percentages of correct responses were computed for the sample of 250 cases from the Vermilion S.D. No. 25 for

September 1951. These percentages are given in Table V. Also in this table are given the sigma scores which correspond to these percentages for a normal distribution.

The range of mental ages on the Detroit norms is from 42 months to 110 months, or a spread of 68 months. Using a normal distribution, the location of an individual on this scale should be determined by no more than six S.D. units of scores. The Detroit Beginning First Grade Intelligence scale has a range of 102 months. If the distribution of scores is normal the mean must be at the mid-point of the range of scores, or 51. With a mean of 66.62 and a standard deviation of 18.55 it will be seen that the mean of the Vermilion distribution is .84 sigma above the mid-point of the range of Detroit weighted scores. With a range of 102 and a S.D. of 18.55 there will be 5.5 sigma units in the scale of months of mental age. Each sigma unit will then correspond to 12.5 months of mental age. A score of .84 sigma will correspond to 10.4 months of mental age. This test is then approximately 10.4 months too easy for the best placing of the test if a normal distribution is to be expected.

*Do the Detroit norms yield an I.Q. that is too high?*

This further question has a bearing on the absolute value of the I.Q. computed from the Detroit norms. Is the I.Q. above or below the mean of 100 of a normal population? The evidence supports the contention that the Detroit norms yield an I.Q. that is too high.

A sample of 3,512 Detroit Beginning First Grade Intelligence Test I.Q. scores was analyzed. The frequency distribution of these I. Q. scores is given in Table VI.

The mean age of this sample was found to be six years and 3.19 months, with a standard deviation of 5.57 months. The mean weighted score was 64.53, with a standard deviation of 18.07. Both the distributions of ages and scores are skewed, positively for ages and negatively for scores. Using Pearson's coefficient, the skewness of the distribution of ages was found to be .67 and the skewness of the distribution of scores was found to be —.54.

The range of the I.Q. scores was from 46 to 157. The mean I.Q. was computed to be 108.18 with a standard deviation of 16.45. The median was computed to be 109.09. Pearson's coefficient of skewness was computed to be —.17.

General practice in intelligence testing has sanctioned the arbitrary assumption of a mean I.Q. of 100 in the population, with the obvious theoretical corollary that fifty per cent will fall above and below this figure. The distribution of Detroit I.Q.'s departs grossly from the widely accepted hypothetical distribution. On

the basis of this sample of 3,512 cases the distribution of Detroit I.Q.'s has only 30% of the cases below I.Q. 100.

TABLE VI
FREQUENCY DISTRIBUTION OF I.Q. SCORES OF EDMONTON SAMPLE

| Mid-Point | Frequency | Mid-Point | Frequency |
|---|---|---|---|
| 157 | 4 | 97 | 219 |
| 152 | 5 | 92 | 300 |
| 147 | 26 | 87 | 228 |
| 142 | 48 | 82 | 116 |
| 137 | 91 | 77 | 53 |
| 132 | 149 | 72 | 32 |
| 127 | 230 | 67 | 22 |
| 122 | 314 | 62 | 12 |
| 117 | 393 | 57 | 7 |
| 112 | 465 | 52 | 5 |
| 107 | 380 | 47 | 1 |
| 102 | 412 | ..... | ..... |
| | | | 3512 |

It is not only from the concept of bisymmetry of the distribution of I.Q.'s about a mean of 100 that the Detroit distribution of I.Q.'s departs. Table VII gives a comparison of the distribution of Detroit I.Q.'s with the classification of David Wechsler.[6]. The chi-square test is applied with 7-1 *df*, and the null hypothesis is that there is no discrepancy of fit between the observed and theoretical distributions. The largest chi-square value in the tables of Fisher and Yates[7] is 16.81 at the .01 level with 6 df. Since the obtained $\chi^2$ is enormously larger than this, the null hypothesis is rejected. In point of fact the disagreement is gross in every category, including both extremities of the distribution.

It may be argued that Wechsler's distribution is applicable only to adults, but as Wechsler notes, the difference between his classification and that of Terman is numerically small, and Terman's classification is applicable to children.[8]

[8]L. M. Terman and M. A. Merrill, **Measuring Inteligence**, p. 33-51.
[7]Fisher and Yates, **Statistical Tables**, p. 41.
[6]David Wechsler, **The Measurement of Adult Intelligence**, pp. 36-42.

## TABLE VII

## COMPARISON OF DISTRIBUTION OF DETROIT I.Q.'s WITH CLASSIFICATION OF DAVID WECHSLER

| I.Q. Limits | Per Cent Wechsler | Per Cent Detroit | Frequency Wechsler | Frequency Detroit | $f_o - f_t$ | $(f_o - f_t)^2$ | $\frac{(f_o - f_t)^2}{f_t}$ |
|---|---|---|---|---|---|---|---|
| 128 and over | 2.2 | 12.47 | 78 | 438 | 360 | 129600 | 1661.54 |
| 120-127 | 6.7 | 13.33 | 235 | 468 | 233 | 54289 | 231.02 |
| 111-119 | 16.1 | 21.98 | 565 | 727 | 207 | 42849 | 75.84 |
| 91-110 | 50.0 | 37.81 | 1756 | 1328 | —428 | 183184 | 104.32 |
| 80- 90 | 16.1 | 10.97 | 565 | 379 | —186 | 34596 | 61.23 |
| 66- 79 | 6.7 | 2.85 | 235 | 100 | —135 | 18225 | 77.55 |
| 65 and under | 2.2 | .77 | 78 | 27 | — 51 | 2601 | 33.35 |
| | | | | | | | $\chi^2$ 2244.85 |

There is one further bit of evidence that the Detroit yields an I.Q. that is too high. The Detroit Beginning First Grade Intelligence Test was administered as a retest to a small sample of 17 cases from rural schools in the Vermilion S.D. No. 25, six months after the beginning of school. The mean I.Q. was computed to be 110.65 with a standard deviation of 14.99. Also six months after the beginning of school the Stanford-Binet Individual Intelligence Examination, Form L, was administered to the same groups. The mean I.Q. from this test was computed to be 97.71 with a standard deviation of 10.12. It is also possible that the mean I.Q. of 108.18 from the 1953 Edmonton sample is higher than would have been obtained had the I.Q.'s been estimated using the Stanford Binet.

## Conclusions

Two conclusions have been well established in this study. One is that the Detroit Beginning First Grade Intelligence Test is a valid test in the sense that the items on the test really discriminate the levels of intellectual ability. The second is that the Detroit Beginning First Grade Intelligence Test is a reliable test. Two additional conclusions have been arrived at which require further research and substantiation. First, the test is too easy for the age group to which it is being administered in Alberta; second, the I.Q.'s computed from the test are too high.

BIBLIOGRAPHY

Davis, Frederick B. *Item Analysis Data.* Cambridge, Graduate School of Education, Harvard University, 1944.

Engel, Anna M. and Baker, Harry J. *Detroit Beginning First-Grade Intelligence Test* (Revised). World Book Company.

Fisher, R. A. and Yates, F. *Statistical Tables.* London, Oliver and Boyd, 1953.

Flanagan, J. C. "General Considerations in the Selection of Test Items." *Journal of Educational Psychology* XXX (December, 1939).

Kuhlmann, F. and Anderson, R. G. *Kuhlmann-Anderson Intelligence Tests* Fifth Edition). Minneapolis, Educational Test Bureau.

Lawshe, Charles H. Jr. *Principles of Personnel Testing.* New York, McGraw-Hill Book Company Inc., 1948.

Terman, L. M. and Merrill, Maude A. *Measuring Intelligence.* Boston, Houghton Mifflin Company, 1937.

Wechsler, David. *The Measurement of Adult Intelligence.* Baltimore, Williams and Wilkins Company, 1944.

# A SURVEY OF THE ARITHMETICAL ACHIEVEMENT OF GRADE FIVE PUPILS IN ALBERTA SCHOOLS*

RALPH O. PRITCHARD

*Principal, Allendale Elementary School, Edmonton*

## Purpose of the Study

The investigation described herein was designed and carried out for the purpose of determining the status of grade V arithmetic in Alberta schools. It attempted to find answers to the following questions: (1) Is there equality of achievement in arithmetic among the grade V pupils of urban, town, graded rural, and ungraded rural schools in Alberta? (2) Does the achievement in arithmetic of Alberta grade V pupils compare favorably with that of similar pupils in other parts of the country? (3) Are there any significant differences between the arithmetical achievement of boys and of girls in the grade V classes of Alberta schools

It was felt that the answers to these questions might supplement the findings of Carmichael and Rees[1], Read and Conquest[2], Coutts and Baker[3], and complement those of Climenhaga[4].

## Selection of the Sample

Representatives of the Faculty Committee on Educational Research of University of Alberta, working with the writer, decided that for the purposes of the survey one thousand grade V pupils randomly chosen from four types of Alberta schools would constitute a suitable sample. A description of each type follows : (1) *urban*—those found in the cities of the province; (2) *town*—those located in the independent towns as listed in the 1953 Annual Report of the Department of Education (no town in which fewer than 200 pupils were enrolled was considered); (3) *graded rural*—centralized divisional schools at which at least three hundred children from farm homes were in attendance; (4) *ungraded rural*—rural schools having one teacher only. The random sampling procedures used resulted in the selection of 975 pupils as follows: urban, 354; town, 222; graded rural, 208; ungraded rural, 191.

---

*This study sponsored by the Alberta Committee on Educational Research.

1Anne Carmichael and Robert E. Rees, "A Survey of Reading Achievement in Alberta Schools", **The Alberta Journal of Educational Research** (March, 1955), pp. 18-33.

2T. James Reid and George R. Conquest, "A Survey of the Language Achievement of Alberta School Children", **The Alberta Journal of Educational Research** (June, 1955), pp. 39-52.

3H. T. Coutts and H. S. Baker, "A Study of the Written Composition of a Representative Sample of Alberta Grade Four and Grade Seven Pupils", **The Alberta Journal of Educational Research** (June, 1955), pp. 5-18.

4Clarence E. Climenhaga, "A Survey of the Arithmetical Achievement of Grade Eight Pupils in Alberta Schools", **The Alberta Journal of Educational Research** (December, 1955), pp. 35-47.

## The Testing Instruments

Through the kind co-operation of the Department of Education, school superintendents, principals, and teachers in the schools concerned, copies of the tests used and of the "Personal Data Sheet" were distributed to each pupil in the sample. The tests were (1) The Otis Quick-Scoring Mental Ability Test, Beta, Form Cm for Grades IV to IX, and (2) The Iowa Every-Pupil Tests of Basic Skills, New Edition, Test D: Basic Arithmetic Skills, Form O, Advanced Battery, for grades IV to IX. The Otis test appears to meet the criterion of usefulness required for this survey. It is not too long; it may be administered by persons lacking special training in testing; scoring is not difficult; the cost is reasonable; and its degree of reliability and validity makes it a suitable instrument for measuring brightness, or for predicting the probable rate of a pupil's progress through school.

The Iowa Test D: Basic Arithmetic Skills, is divided into three sections—Part I, Vocabulary and Fundamental Knowledge; Part II, Whole Numbers and Fractions, Percentages and Decimals; Part III, Problems. The directions for administering are clear and concise, administration time is not unduly long, and graphic representations of the results are suitably symmetrical.

## Otis Intelligence Test Results

A comparison of the Otis Intelligence Quotients gave the following results: the urban sample is shown to be superior to the graded rural, town, and ungraded rural samples; the graded rural sample is superior to the town and ungraded rural samples; the town sample may be slightly superior to the ungraded rural sample. The differences are statistically significant. These findings are summarized in Table I below.

Reasons for the differences in intelligence are difficult to determine. The author of the Otis test states, in part, ". . . any test which involves the use of language can measure mental ability only to the extent to which we may assume that pupils of the same age may have had approximately the same opportunity to learn."[5] T. J. Reid, after a study of current writings on the subject, was able to state with confidence, ". . . there is . . . adequate evidence to suggest that children of foreign parentage suffer a definite handicap in English language achievement."[6]

---

[5]Arthur S. Otis, **Manual of Directions for Beta Test**, p. 1.

[6]T. J. Read, **A Survey of the Language Achievement of Alberta School Children in Relation to Bilingualism, Sex and Intelligence'** p. 19.

TABLE I

COMPARISON OF THE MEAN OTIS INTELLIGENCE SCORES OBTAINED BY FOUR SAMPLES OF GRADE FIVE PUPILS

| Sample | Mean | Difference of Means |
|---|---|---|
| Urban | 105.74 | ..... |
| Town | 98.33 | 7.41 |
| Urban | 105.74 | ..... |
| Graded Rural | 102.69 | 3.05 |
| Urban | 105.74 | ..... |
| Ungraded Rural | 95.85 | 9.89 |
| Town | 98.33 | ..... |
| Graded Rural | 102.69 | 4.36 |
| Town | 98.33 | ..... |
| Ungraded Rural | 95.85 | 2.48 |
| Graded Rural | 102.69 | ..... |
| Ungraded Rural | 95.85 | 6.84 |

A check of the subsamples of the present study revealed that 7.4 per cent of the urban sample, 29.4 per cent of the town sample, 18.2 per cent of the graded rural sample, and 13.5 per cent of the ungraded rural sample indicated that the language of their homes was other than English.

### Iowa Total Test Results

The first stage of the investigation of arithmetical achievement was a study of the total scores of the three parts of the Iowa test. The mean total scores of the four subsamples were compared. It was found that (1) the achievement of urban pupils was not significantly different from that of graded rural pupils; (2) the achievement of urban pupils was superior to that of town pupils and ungraded rural pupils; (3) the achievement of town pupils was superior to that of ungraded rural pupils; (4) the achievement of graded rural pupils surpassed that of town pupils and ungraded rural pupils. In order of superiority of achievement the four subsamples would rank thus; urban, graded rural, town, ungraded rural.

This corresponds with the rank order of the subsamples as determined by comparing the mean intelligence quotients.

The numerical comparison of the mean total scores in shown in Table II. The difference between the means of the subsample in pairs is indicated. The difference between urban and graded rural mean scores was not significant, but all other differences were significant at the .01 level.

TABLE II

COMPARISON OF THE MEAN TOTAL SCORES OBTAINED BY FOUR SAMPLES OF ALBERTA GRADE FIVE PUPILS ON THE IOWA TEST

| Sample | Mean | Difference of Means | Sig. |
|---|---|---|---|
| Urban | 32.29 | ..... | ..... |
| Town | 28.47 | 3.82 | .01 |
| Urban | 32.29 | ..... | ..... |
| Graded Rural | 31.42 | .87 | ..... |
| Urban | 32.29 | ..... | ..... |
| Ungraded Rural | 26.05 | 6.24 | .01 |
| Town | 28.47 | ..... | ..... |
| Graded Rural | 31.42 | 2.95 | .01 |
| Town | 28.47 | ..... | ..... |
| Ungraded Rural | 26.05 | 2.42 | .01 |
| Graded Rural | 31.42 | ..... | ..... |
| Ungraded Rural | 26.05 | 5.37 | .01 |

The rank order of the subsamples, based on mean scores, was the same on Part I (Vocabulary and Fundamental Knowledge) as it was on the total test. However, on Part II (Whole Numbers, Fractions, Percentages, and Decimals), and on Part III (Problems), graded rural scores were slightly, but not significantly, higher than urban mean scores.

These findings make it possible to state with some degree of confidence that there is not equality of achievement in arithmetic among the grade V pupils in four types of Alberta schools.

## Comparison of Alberta Median Scores with Iowa Median Scores

TABLE III

COMPARISON OF THE MEDIAN SCORES OF ALBERTA GRADE FIVE PUPILS ON THE IOWA TEST WITH MEDIAN SCORES OF THE IOWA STANDARDIZATION SAMPLE

| Sample | Iowa Test | Alberta Median | Iowa Median | Dif. | Sig. |
|---|---|---|---|---|---|
| Composite (the total sample ) | Total | 29.21 | 30 | .79 | ..... |
| | Part I | 9.52 | 10.5 | .98 | .01 |
| | Part II | 9.86 | 11 | 1.14 | .01 |
| | Part III | 9.97 | 9.5 | .47 | .01 |
| Urban | Total | 31.44 | 30 | *1.44* | ..... |
| | Part I | 10.46 | 10.5 | .04 | ..... |
| | Part II | 10.28 | 11 | .72 | .01 |
| | Part III | 10.52 | 9.5 | *1.02* | .01 |
| Town | Total | 27.99 | 30 | 2.01 | .01 |
| | Part I | 8.65 | 10.5 | 1.85 | .01 |
| | Part II | 9.33 | 11 | 1.67 | .01 |
| | Part III | 9.99 | 9.5 | *.49* | ..... |
| Graded Rural | Total | 29.50 | 30 | .50 | ..... |
| | Part I | 8.94 | 10.5 | 1.56 | .01 |
| | Part II | 10.55 | 11 | .45 | ..... |
| | Part III | 10.57 | 9.5 | *1.07* | .01 |
| Ungraded Rural | Total | 26.09 | 30 | 3.91 | .01 |
| | Part I | 8.94 | 10.5 | 1.56 | .01 |
| | Part II | 8.76 | 11 | 2.24 | .01 |
| | Part III | 8.26 | 9.5 | 1.24 | .01 |

NOTE: Alberta Median—the median scores of Alberta pupils on the Iowa test.
Iowa Median—the published median scores of the Iowa standardization sample.
Dif.—the difference between the Alberta median and the Iowa median. The italicized figures indicate that the difference favors the Alberta median.
Sig.—significance level.

Examination of Table III reveals that in the twenty comparisons made: (1) the Alberta medians were inferior to the standardization medians in eleven instances: (2) in six cases there were no significant median differences; and (3) in three cases, on Part III of the test, the Alberta medians were significantly superior to the standardization sample medians.

It should be noted that:

The schools involved in the Iowa program are located in communities that range in population from a few hundred to more than 200,000, the majority numbering between 1,000 and 50,000. All are graded public schools; non one-room rural schools are included.[7]

[7]Iowa Every-Pupil Tests. **Manual of General Information 1947**, p. 13.

The achievement of Alberta pupils as represented by the sample used in this investigation was inferior to that of the grade V pupils used in formulating the Iowa norms. This statement must be qualified by reference to the quotation immediately above.

## Sex Differences

The findings relative to the arithmetical achievement of boys and girls may be stated as follows: on the basis of the results of the use of the Iowa Every-Pupil Test of Basic Arithmetic Skills, Form O, Advanced, with four samples of grade V pupils, (1) the girls in the ungraded rural sample were slightly, but not significantly superior to the boys; (2) the boys of the urban sample had significantly better mean scores that the girls in that sample; (3) except for the urban sample, there were no significant differences between the arithmetical achievement of the boys and the girls.

## Conclusions

The Otis Quick-Scoring Test of Mental Ability, Beta, Form C, was administered to nearly one thousand grade V children from various types of Alberta schools. The mean intelligence quotient, as measured by this instrument, was found to be 101.47, with standard deviation of 1.49 and standard error of the mean .399. The four subsamples have been shown to belong, statistically, to the same homogeneous population. Significant differences exist between the mean intelligence scores of urban and rural children. The apparent superiority of the urban sample may be caused by a number of factors. City pupils may be more accustomed to the use of standardized tests, and their familiarity with test procedures may tend to raise their scores. One of the limitations of any group verbal test is that it cannot measure all of the factors which make up general intelligence. Thus, the pupil whose experiences have been more manual and manipulative than verbal may be unable to achieve as his urban counterpart on a verbal test. Selective migration may also contribute to the differences observed. The test results indicate that the probability of academic success of the child in a single-teacher school is somewhat less than that of a child in an urban school.

When the Iowa Every-Pupil Test of Basic Arithmetic Skills was used as a measuring instrument, the results indicated that there is not equality of achievement among the children of the four subsamples. Except for the difference between mean scores on the whole test of the urban and graded rural samples, the differences are all significantly large. Inequalities of arithmetical achievement as indicated may be due to inequalities of intellectual capabilities

and to inequalities of educational opportunity. Little difference exists between the means of urban and graded rural samples. Equality of educational opportunity may be indicated in this one instance.

Insofar as it is possible to make statistical comparisons of Alberta means with those of the standardization sample, it seems valid to draw the following conclusions:

(1) On the total Iowa test, Alberta medians did not differ significantly from the Iowa medians;

(2) The medians of the Alberta sample were somewhat lower than the Iowa medians on Parts I and II of the test, but were significantly higher on Part III;

(3) Medians of the ungraded rural sample were significantly inferior to those of the Iowa standardization sample in all sections of the test. (No pupils from rural schools were included in the standardization sample.)

The findings of this study respecting sex differences in arithmetical achievement are not at variance with those of other studies. The boys of the urban sample were significantly superior to the girls on mean total score and mean Part III score. They showed a tendency to be superior on Parts I and II. Otherwise, no significant differences between the arithmetical achievement of boys and girls were observed.

**Recommendations**

As a result of this survey, the writer makes the following recommendations:

1. There is need for a program to develop standardized Alberta tests, or to obtain Alberta norms for good achievement tests already available.
2. Every possible effort should be made to increase the supply of well qualified teachers for all of the classrooms of the province.
3. The policy of the Department of Education with respect to the centralization of the rural one-room schools should be continued.
4. The province-wide testing program of the Department of Educa- should be continued and expanded, and arrangements completed to make the results of the program readily available to eductionists.
5. Efforts should be directed toward making it possible for smaller centers of population to attract and hold well-trained teachers.

The writer believes that adoption of the recommendations cited would result in a reduction of the inequalities of educational opportunity which appear to exist among various types of Alberta schools.

## BIBLIOGRAPHY

Carmichael, Anne and Rees, Robert E. "A Survey of Reading Achievements in Alberta Schools". *The Alberta Journal of Educational Research* I:1 (March, 1955), pp. 18-33.

Climenhaga, Clarence E. "A Survey of the Arithmetical Achivement of Grade Eight Pupils in Alberta Schools". *The Alberta Journal of Educational Research* I:4 (December, 1955), pp. 35-47.

Coutts, H. T. and Baker, H. S. "A Study of the Written Composition of a Representative Sample of Alberta Grade Four and Grade Seven Pupils". *The Alberta Journal of Educational Research* I:2 (June, 1955), pp. 5-18.

Iowa Every-Pupil Tests of Basic Skills. *Manual of General Information.* Boston, Hughton Mifflin Company, 1947.

Otis, Arthur S. *Manual of Directions for Beta Test.* Yonkers-on-Hudson, World Book Company, 1954.

Reid, T. J. *A Survey of the Language Achievement of Alberta School Children in Relation to Bilingualism, Sex, and Intelligence.* Unpublished Master's Thesis, the University of Alberta, 1954.

Reid, T. James and Conquest, George R. "A Survey of the Language Achievement of Alberta School Children". *The Alberta Journal of Educational Research* I:2 (June, 1955), pp. 39-52.

# JACQUES MARITAIN: MAN AND EDUCATOR

EDWARD BLAKE COLL, *C.S.B.*
*Principal, St. Mary's Boys' School, Calgary*

## Early Life and Education

The life and work of Jacques Maritain may be summed up as a continuous search for truth, for the meaning of reality. This search was not for himself alone but as well for those who might welcome the products of his labors. His refusal to be content with the currently accepted explanations of reality might have been taken as a sign of weakness, or of flight from the hard facts of life. On the contrary his dogged idealism was a sign of moral strength, demanding personal and professional sacrifices not willingly undertaken by most men.

Maritain was acquainted with those who, in his country, were dissatisfied with the products of rationalism, products adumbrated by his countrymen, Voltaire and Diderot. Men such as Beaudelaire, Psichari and Bloy had tried in various ways to find satisfaction of spirit in the material things of the world. Their failure spurred Maritain to seek in other directions. It cannot be alleged that Maritain was out of touch with the hard reality of thought common to the scientifically minded men of his day, since he himself was trained as a scientist. It was the very failure of science to answer his questions on reality that forced him to seek the answers in philosophy. He felt himself impelled to expose the data of science to the light of logical criticism.

Jacques Maritain was born in Paris in the year 1882, a descendant, on his mother's side, of a family prominent in political affairs and noted for fearlessness in the cause of righteousness. From his father he acquired an attitude of devotion to study, leisurely in the father's case, but urgent and crusading in his son.

His early education was gained at the Lycée Henri IV, where his friendship with Ernest Psichari, grandson of Ernest Renan, contributed greatly to the spiritual development of both young men. But neither the philosopsy courses at the Lycée, nor the more advanced courses at the Sorbonne, served to answer more than superficial questions. His inquiries were already metaphysical and eschatological.

His chance meeting with Raissa Oumansoff, his future wife, seemed almost providential, since she too had the same desire to know the meaning of the scientific materials with which they both worked. Her disillusionment seemed a confirmation of his own. The con-

clusion that existence without meaning was unendurable brought them to a contemplation of suicide.

The contact, through friends, with the philosopher Henri Bergson was the first ray of light to fall on this unhappy pair, the first promise that their search was not in vain. Even the faint prospect of attaining a knowledge of the absolute lightened their despair and sent them on the path to the final solution of their difficulties.

It must be admitted that their solution does not commend itself to all persons of intelligence and goodwill. For them, however, it was adequate and satisfying. It was, moreover, clearly not an emotional experience, but one of reason and logic. They were introduced to the writings of St. Thomas Aquinas.

For Maritain, the teachings of St. Thomas were the truths long sought. Penned in the thirteenth century, here were the answers to the doubts and questionings of any age. Obviously the teachings of St. Thomas must be brought into relationship with the intellectual and spiritual problems of the twentieth century. The finger of duty pointed directly to Maritain.

In 1930 Maritain became associated with the Institute of Medieval Studies in Toronto, Canada. During the Second World War he was visiting professor at Columbia University in New York, and later at Princeton University. After the war he returned to France and received the appointment of Ambassador to the Vatican, in which position he served from 1945 to 1948. He then occupied the chair of Philosophy at Princeton University, from which position he retired recently. He still continues to publish essays and articles relating present-day topics to Thomistic philosopsy.

### Maritain's Philosophical Studies

Maritain early began to find flaws in the teachings of Bergson and turned more and more to those of St. Thomas. In these teachings he found the answers not only to his own personal problems but to those of many seekers similarly perplexed.

This challenge faced him, to spread the philosophy of St. Thomas, not as an historical curiosity, but as a working philosophy for modern life. He wanted first to know why this philosophy had so long lain in eclipse. A review of the history of philosophical thought from the period of the Scholastics to the modern times, discovered that Descartes had established a position of great influence on modern thought. In particular there was his notion of innate ideas, which are generated from outside the mind. This relegated the intellect to a role of introversion, to a consideration of ideas already existing within the mind and not, as St. Thomas teaches, to a role of extroversion, a consideration of the external truth of things. This

theory produced what Maritain calls the "angelism" of Descartes, leading men to reject the external world as irrelevant in matters of epistomology, and even of ontology itself. According to Maritain, this misdirection of thought led to a subjectivism masking the absoluteness of truth and the reality of existence. Hence the inevitable failure of his early instructors to answer his questions about the nature of reality. He considered it a duty to re-establish philosophy upon solid ground and to apply Thomistic principles to the problems of modern life.

Maritain maintains that the direct consequence of Descartes' "angelism" is the denial, or, at least, the neglect of the spiritual. This, to him, is a perversion of the true nature of being which can be corrected only by a proper understanding of the nature of man. He showed, according to Thomistic principles, that man is spiritual as well as material. The spiritual part of Man's being is the more important, especially in the attainment of truth, since it is through the operation of this spiritual part that contact is made with the reality of sensible things.

This ability to know individual truths and to be led to the knowledge of the absolute truth seems to Maritain to be the reason for the dignity of man and the solid basis for the respect which is owed him by his fellow men. For this reason, the rights guaranteed man by a democratic state have their origin in the very nature of man, a spiritual nature, capable of a knowledge of the absolute truth. Maritain considered this a lesson from Thomism which would be of value to the modern world since it would give a philosophical explanation of democratic ways of life.

## Maritain's Theory of Education

Maritain was led from his study of the nature of man to a consideration of the problem of education since it dealt with the formation of man according to a definite ideal of what man should be. Maritain accepts the Thomistic view of the purpose of existence. He considers the end of life to be closely connected with the nature of man and his personality. His spiritual nature is the key to the direction which must be given the education of man. The real purpose of man's existence is union with the ultimate truth, attained by a knowledge of the intermediate truths which exist in reality. This final end of man is the goal of education, which prepared him for it.

If one accepts Maritain's first principles, his theory of education seems logical, preparing man step by step for the final knowledge of the ultimate truth. Maritain is firmly convinced of the validity of the Thomistic doctrine, as are those who accept these principles.

There are others in the field of educational philosophy who do not agree with him. Dewey, for example, would consider the very activity of man an end in itself, sufficient to justify and motivate man to act, without reference to a union with ultimate truth. This view seems to place the criterion of man's actions within himself, while Maritain would have it outside the individual. Dewey would stress the sensitive in man while Maritain would stress the role of the spiritual. This view leads Maritain to emphasize the personality of man which rests on the spiritual rather than the individuality which rests on the material. The development of the spiritual element of man will produce one who is aware of the destiny of mankind, and will develop the instrument by which this destiny can be achieved.

### The Dynamics of Education

Maritain proceeds to consider the dynamics of education as producing the desired effect. He follows the Thomists in the explanation of the nature of knowledge, showing that the active intellect of the child is the important instrument in acquiring knowledge. It is the power of the intellect which is in contact with the reality of the object, though this contact is made through the senses. Thus the whole man is engaged in the process of learning, while the role of the teacher is one of encouragement and direction. This theory of learning is in harmony with that of the modern psychologists who stress the need of arousing interest in the student so that he himself may carry out the task of learning. Maritain points out the need of a teacher to create an atmosphere in which the learner can best operate, and speaks of the freedom of the learner as directed by discipline imposed by the teacher for the good of the learner.

### Dispositions to be Fostered in the Pupil

Certain dispositions are to be fostered in the pupil: love of truth, love of justice and love of the good. The word love is used here in the sense of a desire for the object loved. Along with these dispositions, Maritain would have the teacher cultivate a feeling of happiness and an acceptance of the student's condition in life. The teacher must develop in the child a habit of work, not necessarily for the particular piece of work, but rather a sense of responsibility for the task undertaken and the need of carrying it through to a successful conclusion. In this he differs from Dewey who sees the responsibility arising from the very doing of the activity, while Maritain sees it existing in the nature of the person, arising from the spiritual desire for the perfection of the individual. Many modern writers claim to note a lack of this sense of responsibility in the students of today, explaining this lack in different ways, some

deploring the present-day attitude to work, others placing the cause of such an attitude in the modern home-life, the demands of society or the failing of the old-fashioned virtues.

Maritain also sees the necessity of fostering a feeling of co-operation among the students. This attitude meets the approval of modern authorities on education. While the more important agent in the process of learning is the pupil, Maritain does not underrate the place of the teacher in the process. He considers certain principles which must guide the teacher in this work. It is necessary that the teacher keep in mind the liberation of the spiritual powers of the learner. In each individual, spirit and matter, as it were, vie for the ascendency over the individual. If the spirit is to be the master, and Maritain considers this to be the proper order of nature, then there must be discipline and control of the material or animal nature of man. The discipline of the material will free the spiritual. The work of the teacher is to guide this liberation. It is for this reason that Maritain is in favor of discipline, which must always be used for the good of the pupils and never be harsh or cruel, but rather positive and helpful.

Inducement to good work must be positive and not restrictive or negative. This stands in accord with the findings of educational psychologists of the present time. Praise and reward for good actions are the best methods of motivation. Along with these qualities in the good teacher, Maritain stresses the need to develop the power of original thought in the pupil. In this he agrees with the authorities in modern educational problems. He advises the teacher to make sure that the pupil thinks through the problems confronting him, and holds that, unless the pupil does this, the knowledge he gains will be of little use.

Finally, the teacher is advised to foster and respect that intellectual intuition, that direct approach to truth, which is found at certain times in the reasoning of all young people and which is the outward sign of the inner power of the intellect. Maritain considers the liberal arts as the best means of promoting intellectual development, and a liberal education as the proper one for the development of good intellectual habits.

### Various Stages in Education

When Maritain has examined the dynamics of education, the operation of the learning process and the necessary dispositions of the teacher, he proceeds to a consideration of the ability of the pupil to receive instruction. He sees three distinct stages in the development of the student—childhood, adolescence, and maturity. Each stage has its personality characteristics and each demands a

different emphasis on the part of the instructor. The child lives in the realm of imagination and needs instruction which is based on imagery and wonder. Other authorities agree in this, seeing the child as different from the adult, and advocating instruction which takes this difference into consideration.

Maritain maintains that, even at the lowest level, the educative process is to be directed to the acquisition of truth, though the means must be those which will be effective at the child's intellectual level. All the approved means of modern education are to be used, visual education, interest-arousing presentation and controlled direction under the supervision of skilled teachers.

Maritain criticizes modern educational thinking as over-stressing the physical elements in the child-education processes while ignoring or underestimating the spiritual development of the learner. Though he stresses the importance of the imagination, Maritain also sees a possible danger in over-stressing it without adequate controls, since the child lives so deeply in the imaginative realm that the dividing line between reality and imagination is not always clear to him, and the teacher must take precautions that such a distinction be made.

In the adolescent stage, the imagination ceases to be the primary element in the learning process and the adolescent becomes aware of and enamoured of truth. It is the business of the educator to see that this awakening delight in truth be encouraged, lest the searching intellect of the youth lose its enthusiasm and become weary of seeking truth among the uninteresting mass of dully taught material. Some modern educators see education as a preparation for the daily work in which the youth will later engage. They would have the school prepare him for the work of life by teaching him the technicalities of industry rather than the fundamental activities of the intellect. Maritain stresses the delight and desire the adolescent feels in the acquisition of truth, rather than the perfection of the technicalities of the subject-matter which he studies. Maritain claims the emphasis should be on the wide field of the truth rather than on the detailed mastery of the science being learned.

While placing the emphasis on liberal rather than technical education, Maritain sees a very necessary place for the latter in the education of youth, though he does claim a priority for the intellectual development over the mechanical training of the pupil. To carry out his theories as to the emphasis in education, he would have the liberal arts stressed thoughout, beginning in the lower years of the school and advancing to the higher levels of education. He would have philosophy and theology taught by all universities,

though not as compulsory subjects and not limited to any fixed system or school of thought.

### Relationship Between Present Conditions and Education

Maritain sees the present condition of society as a direct result of the philosophy stemming from the doctrine of Descartes. Refusal to seek truth, denial of absolute standards and forgetfulness of the spirituality of man have produced the conditions which are regretted by the thinking men of the present age. These conditions he sees as possible of correction through education. A realization of the worth of the individual, the democratic ideal, can come only through education for truth. It is only through correctness of thinking on the part of the individual that correctness of thinking in society is possible. It is only by accepting the true principles of moral thought that society can be regenerated and led to the freedom and values of democratic living.

The goods of democratic living are for all men, and it is the role of education to place them within the reach of all citizens. To Maritain, this means a liberal education since it is the best development of the intellectual powers of man. Thus it is the duty of the state authority to see that the rights and freedom of education are granted and preserved within the state.

Danger to educational freedom may arise if the state attempts to use its educational system to inculcate political ideas and shape its citizens in a political mold rather than to develop them intellectually. Maritain warns of this danger and points to the unhappy history of those European states which so debased education in the past. The best and surest means of advancing true democratic thinking and living is to allow the schools to carry on their work of intellectual development in the way in which they are best fitted to do so, with state aid if necessary but never with state interference in their proper work.

The training of young citizens is the work of many agencies, of which the school is one. All these agencies must be inspired with a desire to shape the young in the good ideals of life, showing by example the end to which they would guide the learner. Education is the formal presentation of the way of life which is most suitable for the realization of the personal worth and value of the individual. It is by right education that the errors of the past will be corrected and the promises of the future realized. It is for this end that Maritain outlines his theories of education. To this he has dedicated his life and his work. He writes that men of today may be spared the long and painful search which he found necessary.

## BIBLIOGRAPHY

Aquinatis, S. Tomae. *Summa Theologica* (7 Vols.). Taurini, Libraria Marietti, MCMXXXVII.

Bibliotheque de la Revue Thomiste. *Jacques Maritain. Son Oeuvre Philosophique.* Paris, Decsalée de Brouwer, editeurs, 1949.

Maritain, Jacques. *Antimoderne.* Edutions de la Revue des Jeunes. Paris, Desclée et Cie., 1922.

.....*Education at the Crossroads.* New Haven, Yale University Press, 1943.

.....*Freedom in the Modern World* (translated by Richard O'Sullivan). London, Sheed and Ward, 1935.

.....*St. Thomas Aquinas* (translated by J. F. Scanlan). London, Sheed and Ward, 1931.

.....*Three Reformers.* London, Sheed and Ward, 1950.

.....*The Rights of Man and Natural Law* (translated by Doris C. Anson). New York, Charles Scribner's Sons, 1943.

.....*Ransoming the Time* (translated by Lorin Binsse). New York, Charles Scribner's Sons, 1941.

Maritain, Raissa. *Adventures in Grace* (translated by Julie Kernan). New York, Longmans, Green and Co., 1944.

.....*We Have Been Friends Together* (translated by Julie Kernan). New York, Longmans, Green and Co., 1940.

Pegis, Anton C. *Basic Writings of Saint Thomas Aquinas* (2 Vols.). New York, Random House, 1945.

Phelan, Gerald B. *Jacques Maritain.* New York, Sheed and Ward, 1937.

# TEXTS IN MEASUREMENT AND EVALUATION

S. C. T. Clarke and G. M. Dunlop
*Faculty of Education, University of Alberta*

Recent texts in this area appear to fall into three categories: handbooks for teachers, routine treatments of measurement and evaluation, and psychological testing. Every author must decide between the 'how to do it' approach of the handbook, the extensive applications of measurement and evaluation in such areas as reporting, promotions and grouping, and the specialized fields of psychological testing of intelligence, achievement and adjustment. A review of one recent book of each type will indicate the manner in which various authors have handled this problem.

Magnuson, H. W., Larson, C.A., and Shellhammer, T. A. *Evaluating Pupil Progress.* California State Department of Education, Sacramento, 1952. 163 pp.

This is a handbook of evaluation. Its greatest merit is found in the numerous examples collected from the best practices in California schools. The approach is practical rather than theoretical, using an extensive coverage rather than intensive treatment of any one aspect of evaluation. For example, the thirteen chapters average twelve pages each. The chapter on "Evaluating Attitudes" contains a distinction between attitude and opinion, examples of attitude scales developed by Thurstone, Remmers, and Likert, a brief consideration of public and private attitudes, teacher-made attitude scales, unfinished stories, and observation of behavior as methods of appraising attitudes. Obviously, in seventeen pages, a full one of which is utilized for line drawing illustrations, an exhaustive treatment of these topics is impossible. The merit of this book is that the treatment given is sound, understandable, and practical.

Teachers and principals will find *Evaluating Pupil Progress* a most valuable handbook to have on their desks. The coverage includes teacher-made tests of achievement, intelligence testing, appraising personality and interests, such observational methods of appraising behavior as anecdotal records, rating scales, check lists, autobiographies, diaries and sociograms, and reporting pupil progress. As the senior author says in the preface, "The major emphasis in this publication is given to the instructional values to be derived from an all inclusive program of evaluation." The teacher and principal will recognize this practical emphasis.

Jordan, A. M. *Measurement in Education.* McGraw Hill Co., New York, 1953. 521 pp.

Here we have a standard text of over five hundred pages, which is unique in the treatment given to the school subject-matter areas. The teacher of English is naturally most interested in measurement in his area. Many books in measurement and evaluation disappoint such a teacher by general statements not related to this special field. Jordan's book will not disappoint in this respect, for it has three hundred and fifty-seven pages devoted to measurement of the school subjects, from reading and handwriting to business and physical education. Jordan sticks to the title given, and gives emphasis to the description and illustration of the standardized measuring devices in each area. However, from these the alert teacher can secure many sound and proven techniques for classroom use.

*Measurement in Education* rounds out the treatment of evaluation by scholarly parts devoted to measurement of intelligence and personality. One chapter is devoted to statistical methods, and constitutes a splendid review for those who already know statistics.

The author notes in this preface that he has intended to stress the fundamental principles involved in measurement. These principles are illustrated by numerous samples and items from tests. Principals and teachers will find this text an authoritative library reference, but would not likely keep it on their desks as a handbook for aid in the day-to-day job of measurement and evaluation in the classroom.

Thorndike, R. L. and Hagen, E. *Measurement and Evaluation in Psychology and Education.* John Wiley and Sons, New York, 1955. 576 pp.

The ambitious title of this work should not deter the reader. In general content, this text lies between the two previously described. Like *Evaluating Pupil Progress,* it deals with practical classroom problems such as the teacher's own tests, behavioral measures of personality, planning a school testing program, and marking and reporting. Like *Measurement in Education* it has a strong emphasis on measurement by standardized tests. In the preface, the authors claim that the text emphasizes the need to define the objectives of measurement, and that poor test items and the same items improved are used as examples of measurement techniques. The busy classroom teacher might be disappointed to find only two chapters which seem to be directly devoted to these worthy aims, though replete with illustrations from a single unit in social studies, the content of which is alien to the Canadian scene. Further study of this text would indicate that the emphasis on defined objectives does indeed run throughout, and is one of the important and valuable contributions made by this book. The administrator will be pleased

with the chapter on planning a school testing program, since it analyzes the possible functions of program measurement. The succeeding chapter on marking and reporting raises the fundamental principles involved, leaving the particular solutions to the administrator or teacher.

This text casts the net wide. What is done is soundly done, but briefly. In a sense, the book covers a wide area in summary fashion. It is a scholar's book.

## BOOK REVIEW

*YOUTH AND TOMORROW—A Guide to Personal Development in the Early and Middle Teens* by S. C. T. Clarke and J. G. Woodsworth (Toronto, McClelland and Stewart Limited, 1956).

Written for Grade IX students and adopted for use in the schools of Alberta, this textbook is perhaps the first of its kind by Canadian authors. Its general content is stated in the preface: "Most of this book is about personal, rather than physical, development in boys and girls. That is, it deals with how people develop mentally, socially, and emotionally, rather than with the growth and functioning of their bodies."

One of the difficulties in a text of this kind is that the presentation may stress adjustment in the sense of conformity. In an excellent introductory statement, J. D. Griffin, M.D., General Director, Canadian Mental Health Association, considers this difficulty as follows: "A mature person is one who has learned to examine, understand, change and improve his patterns of feelings as an individual in relation to society. The mentally healthy person is not necessarily always a perfectly conforming 'reasonable' and unprotesting person. Yet he is definitely one who has learned self-discipline." Whether the authors have been able to present their material in such a way as to produce the mature individual will await the test of use. The pattern of each chapter (there are sixteen in the book) stresses a factual approach. A situation is described, the facts which bear on this situation are presented, the facts are then carefully interpreted, and finally are applied in a graded series of exercises. The classroom teacher will welcome this latter section, which ranges from vocabulary and knowledge of the facts to class projects which permit the capable teacher to use skill and imagination in the development of the mature individual.

The format of the book is most attractive. It is the handy $5\frac{1}{2} \times 8$ size. The insides of both covers are illustrated with composite photographs of school life. Each of the six parts (Taking Stock, How To Get The Most Out of School, Understanding Myself, Understanding Others, Planning For The Future, Thinking It Over) is preceded by a photograph or a composite illustrating the theme of the part. Over fifty line drawings in half tone are sprinkled throughout the book, to illustrate ideas and heighten the reader's interest. There are few pages in this text which are unbroken print.

Will it be interesting to Grade IX students? Will it help young people to develop mature personalities, citizenship, and character?

Naturally the answer to such questions is dependent not only on the book but on the teacher. The style and level of writing should appeal to the fifteen-year-old, and the numerous examples from school and everyday life help to add interest. Technical terms have been kept to a minimum. Abstract concepts have been described in terms of daily living, wherever possible. However, this reviewer anticipates that the chapter on Living Democratically will challenge the bright student and perhaps leave the mediocre untouched.

*Youth and Tomorrow* omits two areas of personal development: sex education, and the home. It covers a personal inventory, how to study, character development, social relationships, vocational choice, and plans for next year. Curriculum makers each have different ideas of what should be covered in such a book, but the breadth of these mentioned (omitting the controversial areas of sex education and home life) should encourage the wide use of this attractive text.

It bears repeating that *Youth and Tomorrow* is no advocate of "soft psychology", nor does it over-stress the conforming aspect of adjustment. Rather its stress is upon the effective development of unique self-disciplined individuals within a society.

R. S. MacArthur.